

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION**

KOTHMANN ENTERPRISES, INC.,	§	
successor by merger to	§	
Kothmann and Kothmann, Inc.	§	
	§	
Plaintiff,	§	CIVIL ACTION NO. H-01-2668
v.	§	
TRINITY INDUSTRIES, INC.,	§	
	§	
Defendant.	§	

MEMORANDUM AND OPINION

This patent infringement suit involves roadside safety devices designed to absorb the forces generated when vehicles collide with guardrails and other objects along highways and roads to reduce injury and damage. Kothmann Enterprises, Inc. (“KEI”) alleges that two devices manufactured and sold by Trinity Industries, Inc. (“Trinity”)—the Mobile Protection System (“MPS-350”) and the Attenuating Crash Cushion (“TRACC”)—infringe certain claims of United States Patent No. 6,022,003 (the ‘003 Patent) and United States Patent No. 6,505,820 (the ‘820 Patent). Trinity has denied infringement and asserted that the patents are invalid and unenforceable. The parties have filed motions seeking summary judgment as to KEI’s ownership, Trinity’s alleged infringement, and the validity of the patents. The parties had also filed motions seeking summary disposition of Trinity’s affirmative defenses of inequitable conduct and laches. This court denied summary judgment but bifurcated the

case, holding a bench trial on the equitable defenses in May 2005.¹

Based on a careful review of the pleadings, the motions and responses, the parties' submissions, the parties' arguments, and the applicable law, this court enters the following rulings on the pending motions for summary judgment on ownership, infringement, and validity. The results of those rulings are set out below.

- KEI owns both the '003 Patent and the '820 Patent. KEI's motion for summary judgment as to ownership is granted.²
- The MPS-350 and TRACC do not infringe the asserted claims of the '003 Patent. Trinity's motion for summary judgment as to noninfringement is granted.³
- The MPS-350 and TRACC do not literally infringe the asserted claims of the '820 Patent, and prosecution history estoppel bars KEI from asserting infringement under the doctrine of equivalents. KEI's motion for summary judgment on infringement of the asserted claims of the '820 Patent is denied; Trinity's motion for summary judgment of noninfringement is granted.⁴

¹ Trinity moved to bifurcate the trial on those defenses from the trial on liability, asking this court to resolve the equitable defenses in a bench trial before trying liability issues, followed by willfulness and damages issues, to a jury. Although originally opposed to bifurcation of the equitable defenses from the liability and damages issues, KEI withdrew its opposition to a separate bench trial on the equitable defenses. (Docket Entry No. 181).

² Docket Entry No. 135.

³ Docket Entry No. 142.

⁴ Docket Entry Nos. 140, 142.

- The asserted claims of the ‘003 Patent and the ‘820 Patent are not invalid for lack of a written description or as anticipated by prior art. Trinity’s motion for summary judgment on invalidity is denied.⁵

A separate order will issue setting out findings and conclusions on the equitable defenses presented in the bench trial.

The reasons for these rulings are set out in detail below.

I. Background

The asserted claims of the ‘003 Patent and the ‘820 Patent describe roadside safety devices that absorb impact energy from a crashing vehicle while minimizing intrusion into the vehicle’s passenger compartment. The application for what issued as the ‘003 Patent was filed on November 7, 1994; the patent issued on February 8, 2000.⁶ On August 8, 2001, Kothmann and Kothmann, Inc. (“KKI”), KEI’s predecessor, filed this suit, alleging that it owned the ‘003 Patent and that Trinity’s MPS-350 and TRACC devices infringed claims 6, 8, and 12. (Docket Entry No. 1 ¶¶ 6, 9). The divisional application for what issued as the ‘820 Patent was filed on October 1, 1999. That patent issued on January 14, 2003, subject to a terminal disclaimer.⁷ On that same date, KEI filed its first amended complaint in this

⁵ Docket Entry No. 145.

⁶ The application was assigned number 08/335,153 and is referred to as the “‘003 Application.”

⁷ The application was assigned number 09/410,635 and is referred to as the “‘820 Application.” Section 121 provides that “a divisional application which complies with the requirements of section 120 of this title [] shall be entitled to the benefit of the filing date of the original application.” 35 U.S.C. § 121. For patents filed on or before June 8, 1995, a seventeen-year patent term is measured from the date of issuance, rather than the filing of the application, and a claim issued on a continuation application is allowed a patent term measured from its own date of issuance. 35 U.S.C. § 154. A terminal disclaimer causes divisional

lawsuit, asserting that Trinity's MPS-350 and the TRACC infringed claims 6, 8, and 12 of the '003 Patent and that the TRACC infringed claims 3, 4, 11, and 14 of the '820 Patent.⁸

In April 2002, this court held a four-day evidentiary hearing on KKI's motion for a preliminary injunction. The parties presented evidence on infringement, validity, and enforceability. In September 2002, shortly before this court issued its ruling, KEI filed U.S. Patent Application No. 10/236,755 ("the '755 Application") as a continuation of the '003 and '820 Patents. In September 2002, this court denied the motion for a preliminary injunction. In detailed findings and conclusions, this court explained that KKI had not met its burden of showing a reasonable likelihood of success on the merits of its claim that the TRACC and MPS 350 infringed the asserted claims of the '003 Patent. (Docket Entry No. 62).

In September 2003, after an evidentiary hearing, this court issued a *Markman* order construing the disputed terms of the '003 Patent and the '820 Patent.⁹ (Docket Entry No. 90). Within a few weeks, a continuation application and amendment in the '755 Application were filed, adding language to address—and change—an aspect of the *Markman* ruling unfavorable to KEI's infringement allegations in this suit. In 2004, the patent examiner issued a notice of allowance of the pending claims in the '755 Application. The '755 Application was pending in May 2005 when this court held a bench trial on Trinity's

applications to expire at the same time of the parent patent.

⁸ Docket Entry No. 65.

⁹ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

affirmative defenses of inequitable conduct, laches, and equitable estoppel. (Docket Entry Nos. 229–31).

A. The Accused Devices: the MPS-350 and the TRACC

Trinity’s Highway Safety Products Division manufactures and sells over 10,000 products, including the MPS-350 and the TRACC. The MPS-350 is a “truck-mounted attenuator,” an energy-absorbing device attached to the rear of a road work truck or utility vehicle. The device is designed to provide a controlled stop for a vehicle that impacts the work vehicle. The TRACC is a “crash cushion” that attaches to the end of a guardrail, bridge pier, or other longitudinal roadside barrier, to absorb the impact of a vehicle striking the end of the barrier. Both devices are patented: the MPS-350 by United States Patent No. 5,947,452 (the “MPS 350 Patent”) and the TRACC by United States Patent No. 6,293,727 (the “TRACC Patent”). Trinity manufactures and sells the MPS-350 and the TRACC through a license agreement with the patent owner. James Albritton is the inventor of both devices and testified as an expert witness for Trinity in this litigation. Albritton began developing the MPS-350 in April 1995; Trinity has been selling it since September 1996. In 1997, Albritton gave a presentation on the design and operation of the MPS-350 at a meeting of the Transportation Research Board in Washington, D.C. Dr. Dean Sicking, one of the inventors of the ‘003 and ‘820 Patents, attended the meeting. (Docket Entry No. 42, Preliminary Injunc. Hearing Tr., vol. II, p. 15).

Albritton began developing the TRACC in the summer of 1996 and completed the design in July 1998. Trinity began selling the TRACC in February 1999. The TRACC is

designed to be attached to the end of a guardrail, bridge pier, or other longitudinal barrier to absorb the impact of a vehicle that hits the end of the barrier. The end of the TRACC that faces the road—the impact head—is covered with a plastic nose and reflectors. When a vehicle hits the impact head, it pushes a sled located on the base of the structure, through the center of a set of longitudinally-aligned side panels. The panels run parallel to one another with a hollow space or channel between them. The sections of the side panels are designed so that the end of each section fits inside the next consecutive section. When a vehicle hits the impact head, the sled moves and pushes the end of the first section, making the sections stack into each other or “telescope” until the vehicle stops or reaches the last section. As the sections telescope, cutting occurs along the base of the structure. Two square hollow beams run parallel to one another for the length of the system. These beams are located under, and in the direction of, the side panels. The inside wall of each beam has an one-inch gap, or channel, running longitudinally approximately half-way up the height of the beam. This wall is called the “backup plate,” or flange plate. Vertical metal plates called “rip plates” are bolted to the backup plates, over the one-inch channels. A “cutter plate” is mounted on the bottom of the sled and extends across the two beams. The cutter plate is a one-half inch thick metal plate with rounded edges. The cutter plate is rectangular, with two v-shaped angles cut into the leading edge. The plate is positioned so that as the sled pushes the cutter plate along the beams, the outer leg of the “v” on each side of the cutter plate contacts the rip plate

at a forty-five degree angle. As the cutter plate passes between the beams and through the rip plates, the contacting edges of the cutter plate cut into the rip plates, pushing or stretching the metal around the edges of the backup plates and into the hollow beams.

The MPS 350, the “truck-mounted attenuator,” is approximately fourteen feet long. It consists of a cutter plate, beams containing a channel, and rip plates. Like the TRACC, the MPS 350 uses two modes of energy absorption, the telescoping of the side panels and the cutting of the rip plates. Like the TRACC’s cutter plate, the MPS 350’s cutter plate is positioned so that the contacting edges of the plate strike the rip plates at a forty-five degree angle. The rip plates are bolted to the backup plates. Unlike the TRACC, in which the cutter plate is pushed along the beams, in the MPS 350, the beams are pushed into a mounted cutter plate. A bracket mounts the MPS 350 cutter plate under the rear of the truck. If a vehicle strikes the rear of the work truck, the bracket rotates from a forty-five degree angle to the roadway to a ninety degree angle to the roadway, positioning the cutter plate parallel to the roadway and aligned with the beams and rip plates. This pivoting action allows the system to be raised and lowered for transport. (Docket Entry No. 47, pp. 196–98).

II. The ‘003 Patent and the ‘820 Patent

The ‘003 Patent and the ‘820 Patent share inventors—Dr. Dean Sicking and Brian Pfeiffer—and specifications. The “Background of the Invention” section in both patents describes the claimed technology, as follows:

This invention relates to guardrails intended to be positioned along a highway to reduce injury to the driver and passenger of vehicles that may accidentally tend to leave the highway.

In one class of guardrail system, each guardrail system includes an elongated barrier and at least one energy-absorbing terminal. The elongated barrier extends parallel to the roadway along the side of the roadway and ends in a terminal. The terminal cooperates with one or more components of the barrier to absorb energy when a vehicle hits the terminal itself.

The terminal is constructed to stop the vehicle without subjecting the occupant to excessive forces and to avoid impaling the passenger compartment of the vehicle or redirecting the vehicle in a dangerous direction or permitting the vehicle to continue in a dangerous direction at a dangerous speed when the vehicle hits the terminal itself. The barrier is designed to redirect the vehicle in a safer direction and impede its progress when the vehicle hits the barrier itself.

The terminals and barrier of the energy-absorbing guardrail are designed so that: (1) when the vehicle hits the barrier itself, the barrier is anchored by a cable or similar component with tensile strength to support the vehicle from moving excessively in a direction perpendicular to the roadway; and (2) when the vehicle hits the terminal, the cable or other support member is released to avoid pulling the barrier out of its alignment with the terminal which would prevent movement of the terminal and barrier together to absorb energy.

(Docket Entry No. 65, Ex. 1, '003 Patent, col. 1, ll. 1–30; Docket Entry No. 65, Ex. 5, '820

Patent, col. 1, ll. 10–39). The Summary of the Invention states in relevant part as follows:

It is an object of the invention to provide a novel guardrail system.

It is a further object of the invention to provide a novel energy-absorbing terminal for guardrail systems.

It is a still further object of the invention to provide a method and apparatus for absorbing the energy of a vehicle that collides with a guardrail system.

It is a still further object of the invention to provide a method

and apparatus for restraining and redirecting vehicles that collide with guardrail systems.

It is a still further object of the invention to provide a method and apparatus for making and using an energy-absorbing guardrail terminal that can be inexpensively adapted for different types of guardrails.

It is a still further object of the invention to provide a method of making guardrails adapted for a particular highway and a guardrail which can be inexpensively adapted for the different highways.

It is a still further object of the invention to provide a method an energy-absorbing guardrail terminal useful with beams of reinforced plastic in a guardrail.

In accordance with the above and further objects of the invention, a guardrail system includes a guardrail and guardrail terminal arranged so that the terminal cooperates with the guardrail to absorb energy if a vehicle hits the terminal and releases the guardrail upon impact of the vehicle with the terminal but anchors the guardrail if the guardrail is impacted by the vehicle instead of the terminal.

The terminal assembly includes an impact head and a cutting section. When the impact head is hit by a vehicle, it moves the cutting section in a manner to cut the beam of the guardrail and activates an anchor release to release the anchor from the guardrail itself. In the preferred embodiment, the guardrail is released from a cable by breaking the first post which has the cable bolted to it at one end. The other end of the cable is mounted to the guardrail. The post breaks at the cable connection, releasing the cable.

The cutting section includes a tube having one or more cutting members within it and a deflection plate. The cutting member or members are designed to aid the deflection plate in the absorption of energy.

(*Id.*, ‘003 Patent, col.2, ll.1–46; ‘820 Patent, col. 2, ll. 12–55).

The shared specification of the ‘003 and ‘820 Patents describes one embodiment of the invention directed to the end of a guardrail, and an alternative embodiment that is attached to a “concrete structure” “such as an overpass or the like.” Figures 3 and 4 in both the ‘003 and the ‘820 Patents show the guardrail embodiment from the side, with a vehicle positioned to hit the terminal end.¹⁰ The guardrail is mounted to a series of posts, preferably made of wood, parallel to the roadway. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 4, ll. 14–18, col. 5, ll. 24–37; Docket Entry No. 65, Ex. 5, ‘820 Patent, col. 4, ll. 20–4, col. 5, ll. 32–4). The vehicle hits the impact head (30), pushing the cutting section (36) forward. Cutters are positioned inside the cutting section to cut along the guardrail (16) as the cutting section moves forward, absorbing the energy of impact and slowing the vehicle.

Figure 3 and 4 are set out below:

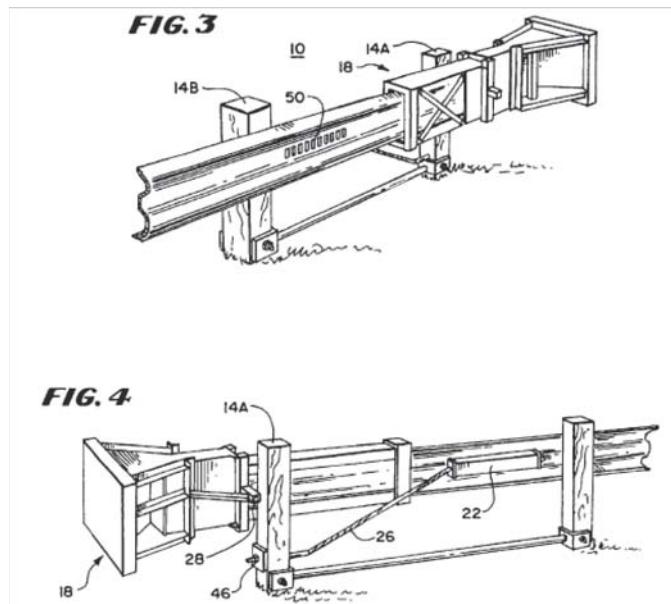
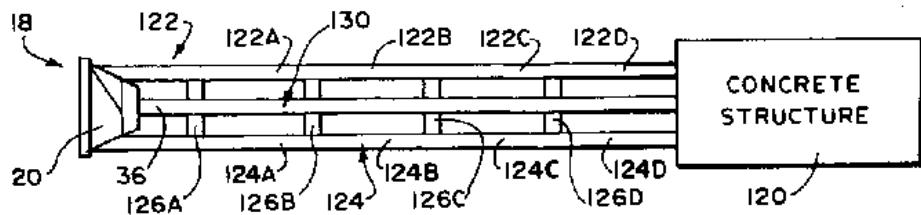


Figure 14 is a vertical view of an embodiment attached to a concrete structure.

¹⁰

The ‘820 Patent contains the same figures as the ‘003 Patent.

FIG. 14



B. The Asserted ‘820 Patent Claims

As noted, the ‘820 Patent was filed as a divisional application of the ‘003 Patent on October 1, 1999 and issued on January 14, 2003. Independent claim 3 of the ‘820 Patent reads as follows:

An energy-absorption system for positioning along a roadway to absorb the energy of an errant vehicle, the energy-absorption system comprising:

an impact head;

an angled cutter; and

an elongated cuttable member horizontally mounted between two parallel guardrails;

wherein the energy absorption system is positionable along a roadway to cooperate with the upstream portion of a roadside hazard; and

wherein the impact head is in operational connection with the cutter and the cuttable member such that the impact of an errant vehicle with the impact head will cause the cutter to cut at least a portion of the cuttable member to absorb the impact energy of the errant vehicle.

(Docket Entry No. 65, Ex. 5, ‘820 Patent, col. 9, ll. 27–42). Dependent claim 4 states that

“[t]he energy-absorption system of claim 3 wherein each of the two parallel guardrails is

constructed of overlapping guardrail sections.” (*Id.* at col. 9, ll. 43–45). Dependent claim 11 states that “the energy-absorption system of claim 3 wherein the angled cutter comprises a cutter that is positioned such that at least one edge of the cutter approaches the cuttable member at an acute angle.” (*Id.* at col. 10, ll. 1–4).

Independent claim 14 requires:

An energy-absorption system for positioning along a roadway to absorb the energy of an errant vehicle, the energy-absorption system comprising:

an impact head;

an angled cutter;

two parallel guardrails, each of which is constructed of overlapping guardrail sections; and

an elongated cuttable member mounted horizontally between the two parallel guardrails;

wherein the energy absorption system is positionable along a roadway to cooperate with the upstream portion of a roadside hazard; and

wherein the impact head is in operational connection with the cutter and the cuttable member such that the impact of an errant vehicle with the impact head will cause the cutter to cut at least a portion of the cuttable member to absorb the impact energy of the errant vehicle.

(*Id.* at col. 10, ll. 11–28).

Following the *Markman* hearing, this court construed the disputed terms of the ‘820 Patent, as follows:

An “angled cutter” is an angled structure that cuts, wherein “angled” means that at least one edge of the angled structure

is oriented other than perpendicular to the material to be cut.

The limitation “an elongated cuttable member horizontally mounted between two parallel guardrails” means that the “elongated cuttable member” must be horizontally mounted in the space that separates two parallel guardrails.

(Docket Entry No. 90, pp. 51–58).

C. The Prosecution History of the ‘003 and ‘820 Patents

Brian Pfeifer and Dean Sicking are the named inventors on the application for the ‘003 Patent. Sicking, a professor at the University of Nebraska (“UNL”), has been granted twenty-one patents for roadside safety devices. He owns a company, Roads Systems, Inc., that sells and manufacturers such devices. Shortly after the application for the ‘003 Patent was filed, Sicking and Pfeifer assigned all rights in the invention to the UNL Board of Regents. (Docket Entry No. 135, Ex. 2). Before the ‘003 Patent issued, UNL granted a license in the claimed invention to Interstate Steel Corporation (“ISC”), a company owned by Kaddo Kothmann. Kothmann was the sole officer, director, and shareholder of KEI’s predecessor, Kothmann & Kothmann, Inc. (“KKI”). Kothmann is also the president of ISC and is now the president and secretary of KEI. Sicking is a licensee of the ‘003 Patent and testified as an expert for KEI in this litigation.

The original application for the ‘003 Patent, filed on November 7, 1994, disclosed two “means” of cutting a “guardrail” and consisted of sixteen claims, including claims for a guardrail system, a guardrail terminal, and a method of manufacturing a guardrail terminal. (Docket Entry No. 145, Ex. 1). The ‘003 Patent application was prosecuted by Vick Carney, a patent attorney who worked for UNL. In January 1995, the patent examiner issued a

restriction requirement.¹¹ The applicants elected to pursue only the claims directed to a guardrail system. (Docket Entry No. 141, Ex. B). In May 1996, Sicking filed an express foreign counterpart application of the ‘003 Patent, Publication No. WO 96/13972, with the World Intellectual Property Organization.

The patent examiner rejected the claims in the ‘003 Patent Application as anticipated by U.S. Patent No. 4,655,434 issued to Bronstad (the “Bronstad ‘434 Patent”), and as obvious. The obviousness determination was based on the Bronstad reference; a patent issued to Sicking (U.S. Patent No. 5,078,366, the “Sicking ‘366 Patent”); a patent issued to Gertz (U.S. Patent No. 5,022,782); and another patent issued to Gertz (U.S. Patent No. 5,403,113). The patent examiner found that the Sicking ‘366 Patent disclosed all the limitations in the pending claims except a cutting means and that the Bronstad ‘434 Patent made the cutting means obvious.

The Bronstad ‘434 Patent disclosed a guardrail system in which bolts progressively cut or shred metal tabs separating slots in the guardrail as the impact head is pushed by an impacting vehicle. The system consists of a set of horizontally overlapping guardrail sections with a series of closely-spaced slots. The guardrail segments are attached by bolts extending through the slots. “Preferably the openings are slots elongated in the horizontal direction and the rails are staged to allow the upstream rails to telescope over the downstream rails.” When a vehicle impacts the nose of the terminal, the bolts are forced to move from one slot to the

¹¹ The PTO issues a restriction requirement when it “finds that two or more inventions claimed in a patent application are ‘independent and distinct’.” *Helifix Ltd. V. Blok-Lok, Ltd.*, 208 F.3d 1339, 1348 (Fed. Cir. 2000).

next and “shred out the rail material between the spaced openings to absorb the kinetic energy of the impacting vehicle.” (Docket Entry No. 146, Ex. 5).¹²

In February 1997, the applicants filed an amendment in the ‘003 Application to replace the claim term “guardrail” with the term “cutable member” and replace the term “guardrail system” with “energy-absorption system.” In response to the patent examiner’s anticipation rejection based on the Bronstad ‘434 Patent, the applicants argued that the amended claim

recites cutting means positioned to cut the cutable member. Bronstad discloses bolts in slots which are intended to split portions between a line of holes. Applicant does not believe, based on applicants (sic) testing, that these bolts will cut the guardrail but instead the guardrail fails by buckling. . . . Cutting means is not, using ordinary language of this art, readable on Bronstad’s bolts which are at best holding means which force compression and bending of the guardrail or fracturing of parts of it.

The patent examiner rejected the amended terms as anticipated by the Bronstad ‘434 Patent. The examiner concluded that Bronstad disclosed “an energy absorbing system . . . including

¹² The Background of the Invention section in the Bronstad ‘434 Patent describes the spearing effect problem created by the upstream end of guardrail barriers, as follows:

The most common guardrail in the U.S. is constructed using the standard steel W-beam mounted on spaced wood or steel posts. Because the W-beam functions primarily in tension when redirecting impacting vehicles, a function of the end is to provide necessary anchorage for the beam to develop necessary tensile forces. In addition, since the guardrail end represents a discontinuity in the barrier system, it is subject to being struck “head-on” by vehicles. . . . These head-on impacts have proved to be troublesome with W-beam barriers because of the significant spearing strength of the beam element.

(*Id.*, ‘434 Patent, Background Section).

cutting means, splice bolts . . . positioned to cut the cutable member as the cutable member and cutting section are moved with respect to each other by the impact head.”

The applicants appealed to the PTO Board of Appeals, urging that the Bronstad ‘434 Patent used bolts “to deform the metal,” while the dual-plate cutter or the wedge-shaped cutter disclosed in the ‘003 Patent Application “cut” or “sheared” the metal. The PTO Board of Patent Appeals reversed the examiner’s rejection. The Board’s opinion stated in part as follows:

We agree with the applicants that the claimed “cutting means” is not readable on the bolts. . . . In that regard, the claimed “cutting means” must be given its broadest reasonable interpretation consistent with the specification, and must be read in light of the specification as it would be interpreted by one of ordinary skill in the art. . . . In this case, the specification discloses (1) the cutters are wedge shaped, and (2) the cutters slice the rail [] with a “shearing” action. In our view, an artisan would readily recognize the basic difference between cutting as disclosed in this application and the shredding disclosed by Bronstad. . . . [T]he claimed “cutting means” is not readable on the bolts [] of Bronstad since the bolts [] will shred out rail material, not “cut” the rail material.

(Docket Entry No. 160, Ex. 9). The claims in the ‘003 Patent as issued recite a “cutting means.”

In May 1998, Trinity filed a patent infringement suit against KEI’s predecessors and Dr. Sicking, one of the inventors listed on the ‘003 Patent. Trinity alleged that certain commercial embodiments of the ‘003 Patent—the BEST, SKT, and FLEAT guardrail systems—侵犯了 a patent then licensed by Trinity, U.S. Patent No. 4,928,928 (the “Sicking ‘928 Patent”). That patent lists Sicking as an inventor. The ‘003 Patent describes the Sicking ‘928

Patent, the subject of the 1998 lawsuit filed by Trinity, and another Sicking patent as prior art energy-absorbing guardrails that use a terminal to extrude a metal portion of the barrier when impacted by a vehicle, “absorbing energy from metal working the rail.” (Docket Entry No. 65, Ex. 2, ‘003 Patent, col. 1, ll. 32– 40). According to the ‘003 Patent specification, in both of Sicking’s prior inventions, “it is difficult to adapt the basic design to absorb energy at different rates depending on the nature of the roadway along which it is positioned.” (*Id.*, ‘003 Patent, col. 1, ll. 31–49).

On July 20, 1999, the PTO issued a Notice of Allowability on the application for the ‘003 Patent. On October 1, 1999, the application for the ‘820 Patent was filed in the PTO as a divisional application of the ‘003 Patent. The divisional application reasserted the claims originally filed in the ‘003 Patent Application that were withdrawn in response to the patent examiner’s 1995 restriction requirement. All of the claims recited a “terminal.” The ‘003 Patent issued to UNL on February 8, 2000.

Meanwhile, the patent examiner had provisionally rejected certain claims in the ‘820 Application on the basis of “double patenting” and anticipation in light of the Bronstad ‘434 Patent. After the ‘003 Patent issued, the applicants filed an amendment in the ‘820 Application, changing the title from “guardrail” to “guardrail terminal.” On August 7, 2000, after the ‘003 Patent had issued, the examiner for the ‘820 Patent Application issued a final rejection for all but two claims, finding that the rejected claims were anticipated by the Bronstad ‘434 Patent and obvious in view of the Bronstad Patent and the Sicking ‘366 Patent. These were the same prior art references the patent examiner cited during the ‘003 Patent

prosecution. On September 7, 2000, Carney, the patent attorney, filed a request for continued examination, an amendment, and a terminal disclaimer voluntarily relinquishing any part of the term of the ‘820 Patent that would extend past the expiration of the ‘003 Patent. (Docket Entry No. 141, Ex. 10).¹³

In September 2000, the UNL Board of Regents assigned the ‘003 Patent and the ‘820 Patent application to ISC. After the assignment to ISC, Henry Ehrlich, a lawyer with Winstead, Sechrest, & Minick P.C., took over as the lawyer prosecuting the ‘820 Patent Application. Charles Rogers, a partner at Winstead, has represented Kothmann and his companies, KKI, KEI, and ISC, for an extended period. Rogers is lead counsel for KEI in this litigation. Pfeifer, the coinventor of the ‘003 Patent, testified that he did not know about the ‘820 Patent Application until he was subpoenaed to testify in this case. (Docket Entry No. 148, Ex. 24, p. 149). Ehrlich testified that he did not consult with either Pfeifer or Sicking during the prosecution of the ‘820 Patent. (*Id.*, Ex. 17, p. 10).

Ehrlich filed several requests for continued examination and requests for expedited procedure after he took over the prosecution of the ‘820 Patent Application in 2000. In April

¹³ See *In re Goodman*, 11 F.3d 1046, 1052 (Fed. Cir. 1993) (“To prevent extension of the patent right beyond statutory limits, the doctrine of obviousness-type double patenting rejects application claims to subject matter different but not patentably distinct from the subject matter claimed in a prior patent.”); *Ortho Pharm. Corp. v. Smith*, 959 F.2d 936, 940 (Fed. Cir. 1992) (“Unlike ‘same-invention’ double patenting, obviousness-type double patenting can be overcome by filing a terminal disclaimer.”); see also *Geneva Pharms., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373 (Fed. Cir. 2003).

2001, the patent examiner issued a second final rejection and on June 7, 2001, Ehrlich filed a request for expedited procedure and a continuation application.¹⁴

On August 8, 2001, KKI filed its original complaint and preliminary injunction application in this suit, asserting that Trinity's MPS-350 and TRACC infringed the '003 Patent. On August 29, 2001, Trinity filed its original answer and opposition to the motion for a preliminary injunction. (Docket Entry No. 5). That same day, Ehrlich filed a request for expedited procedure in the PTO.

On October 16, 2001, Trinity filed a motion for summary judgment asserting that the '003 Patent was invalid on the basis of three prior art patents: U.S. Patent No. 3,777,591 issued to Rands (the "Rands '591 Patent"); U.S. Patent No. 3,782,505 issued to Armstrong (the "Armstrong '505 Patent"); and U.S. Patent No. 3,428,150 issued to Muspratt (the "Muspratt '150 Patent"). (Docket Entry No. 17). On December 11, 2001, Ehrlich filed a request for expedited procedure in the '820 Patent Application with the Patent Office. That same day, Ehrlich filed an Information Disclosure Statement ("IDS") with the PTO, disclosing

¹⁴ After the PTO issues a final office action, an applicant is limited to one of three options: (1) filing a notice of appeal under 37 C.F.R. § 1.181; (2) filing a request for continued examination under 37 C.F.R. § 1.114; or (3) filing an amendment under 37 C.F.R. § 1.116. Section 1.116 allows amendments in lieu of appeal, as follows:

- (1) An amendment may be made canceling claims or complying with any requirement of form expressly set forth in a previous Office action;
- (2) An amendment presenting rejected claims in better form for consideration on appeal may be admitted; or
- (3) An amendment touching the merits of the application or patent under reexamination may be admitted upon a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented.

eleven prior art references, including the Rands ‘591 Patent, the Muspratt ‘150 Patent, and the Armstrong ‘505 Patent. Ehrlich did not disclose this ‘003 Patent infringement litigation, despite the fact that the source of the prior art references was Trinity’s submissions in this litigation.

Erlich also filed an amendment to change the means-plus-function limitation of a “means for cutting” to the structural limitation of a “cutter.” Other amendments deleted the “terminal” limitation from the claims and added fifteen new claims. (Docket Entry No. 141, Ex. 27). Again, there was no disclosure of this litigation, despite the fact that the amendments resulted from information Trinity provided and positions it took in this litigation. Specifically, Trinity asserted in this litigation that the “cutting means” limitation of the ‘003 Patent claims was not present in either the MPS-350 or the TRACC and that the “terminal” limitation of the ‘003 Patent meant that devices such as the MPS-350, which attach to the back of work trucks, did not infringe.

This court held a four-day evidentiary hearing on the preliminary injunction application in April 2002. In that hearing, Trinity fully presented the basis for its positions as to why the “cutting means” and “terminal” limitations in the asserted ‘003 Patent claims meant that the MPS-350 and the TRACC did not infringe. Before the hearing, Trinity had cited the Gertz ‘484 Patent as potentially invalidating prior art and argued that the failure to disclose it during prosecution of the ‘003 Patent violated the applicants’ duty of disclosure. The applicants did not disclose the lawsuit or the allegations, including the invalidity or inequitable conduct allegations, to the Patent Office.

On July 17, 2002, Ehrlich filed a request for continued examination of the ‘820 Patent Application, filed a terminal disclaimer, filed an IDS, submitted arguments to the examiner, and made several amendments. “Cutter” was changed to “angled cutter” and “cuttable member” was changed to “elongated cuttable member.” Several of the new independent claims that had been added on December 11, 2001 were deleted and some of the dependent claims were rewritten in independent form. The IDS disclosed the prior art Gertz ‘484 Patent, but did not disclose the lawsuit or other information from the lawsuit.

The examiner had rejected the claims of the ‘820 Patent Application as anticipated, on the basis that the Bronstad ‘434 Patent set forth an energy-absorption system comprising an impact head, a cutter, and a cuttable member. Ehrlich argued that the examiner’s rejection of the ‘820 Patent Application was unjustified, emphasizing that the PTO Board of Patent Appeals had reversed the examiner’s similar rejection of the ‘003 Patent’s “cutting means” element:

Applicants again submit that Examiner has failed to provide a *prima facie* showing of anticipation by Bronstad. Applicants further submit that Bronstad does not anticipate Applicants’ claimed invention. Applicants respectfully direct Examiner to the decision of the [PTO Board of Patent Appeals] regarding Bronstad and the parent application and patent in this case, [the ‘003 Patent]. Examiner is respectfully reminded that Bronstad does not disclose the “cutting means” claimed in the parent application and patent. Applicants therefore submit that Bronstad likewise does not disclose a “cutter” as suggested by Examiner. It is therefore respectfully requested that Examiner withdraw the outstanding rejection.

On August 1, 2002, the patent examiner issued a Notice of Allowability on the ‘820 Patent Application. On September 6, 2002, KEI filed the ‘755 Application as a continuation of the

‘003 Patent, listing Sicking and Pfeifer as inventors. The applicants did not disclose this lawsuit or any information about it. On September 20, 2002, this court issued a lengthy opinion denying the application for a preliminary injunction, finding that KEI had failed to show a substantial likelihood of succeeding on the merits of its claim that Trinity’s MPS-350 and TRACC products included the “cutting means” limitation in independent claim 6 of the ‘003 Patent. (Docket Entry No. 62). On December 5, 2002, the patent examiner issued an office action in the ‘755 Application, rejecting the claims on the basis of double patenting over the ‘003 Patent.

On January 14, 2003, the PTO issued the ‘820 Patent to KEI. That same day, KEI filed its first amended complaint in this lawsuit, asserting that Trinity’s TRACC product infringed certain claims of the ‘820 Patent. (Docket Entry No. 65). In February 2003, Trinity filed its amended answer and counterclaims, asserting affirmative defenses of prosecution laches and inequitable conduct based on the failure to disclose litigation information to the patent examiner during the ‘820 Patent prosecution. In June 2003, the applicants provided written notice of the existence of this litigation to the PTO as part of the ‘755 Application.

In August 2003, this court held a *Markman* hearing and issued the *Markman* order in early September. In October 2003, the applicants filed a continuation application and amendment in the ‘755 Application, adding new claims. The applicants stated that the amendment was intended in part to address one part of the *Markman* ruling, which interpreted the limitation of ““an elongated cuttable member horizontally mounted between the two parallel guardrails’ to mean that the ‘elongated cuttable member’ must be horizontally

mounted in the space that separates two parallel guardrails.’’ The applicants submitted new claims tracking the language of claims 3 and 14 of the ‘820 Patent, including their related dependent claims, to add the words ‘‘when viewed from above’’ in a parenthetical to modify the ‘‘between’’ language of these claims. In so doing, the applicants stated that they would be filing an IDS to include litigation materials, including the court’s *Markman* order, but the IDS apparently was not filed. In December 2003, the applicants submitted an IDS in the ‘755 Application, but that IDS apparently was lost. In February 2004, the patent examiner issued a notice of allowance of the pending claims in the ‘755 Application, noting that no IDS had been received. When the notice of allowance issued, the examiner had scant information about this lawsuit. The applicants filed a continuation application and an IDS in March 2004. In December 2004, the patent examiner again issued a notice of allowance for the ‘755 Application claims.

The pending motions address issues of ownership, infringement, and validity. The bench trial held on March 2005 addressed Trinity’s equitable defenses. The motions are addressed below. A separate order will set out findings and conclusions relating to the equitable defenses.

III. The Summary Judgment Standard

Summary judgment is appropriate if no genuine issue of material fact exists and the moving party is entitled to judgment as a matter of law. *See FED. R. CIV. P. 56.* Under FED. R. CIV. P. 56(c), the moving party bears the initial burden of ‘‘informing the district court of the basis for its motion and identifying those portions of [the record] which it believes

demonstrate the absence of a genuine issue of material fact.” *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986); *Stahl v. Novartis Pharms. Corp.*, 283 F.3d 254, 263 (5th Cir. 2002). If the burden of proof at trial lies with the nonmoving party, the movant may either: (1) submit evidentiary documents that negate the existence of some material element of the opponent’s claim or defense; or (2) if the crucial issue is one on which the opponent will bear the ultimate burden of proof at trial, demonstrate that the evidence in the record insufficiently supports an essential element or claim. *Celotex*, 477 U.S. at 330. The Federal Circuit has stated that district courts must approach motions for summary judgment on the issue of infringement “with great care.” *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 528 (Fed. Cir. 1996); *see Chem. Eng’g Corp. v. Essef Indus., Inc.*, 795 F.2d 1565, 1571 (Fed. Cir. 1986) (“In approaching a motion for summary judgment of infringement or non-infringement, a district court must proceed ‘with a care proportionate to the likelihood of its being inappropriate.’”) (quoting *D.M.I., Inc. v. Deere & Co.*, 755 F.2d 1570, 1573 (Fed. Cir. 1985)).

The party moving for summary judgment must demonstrate the absence of a genuine issue of material fact, but need not negate the elements of the nonmovant’s case. *Boudreaux v. Swift Transp. Co., Inc.*, 402 F.3d 536, 540 (5th Cir. 2005). “An issue is material if its resolution could affect the outcome of the action.” *Weeks Marine, Inc. v. Fireman’s Fund Ins. Co.*, 340 F.3d 233, 235 (5th Cir. 2003) (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986)). If the moving party fails to meet its initial burden, the motion for summary judgment must be denied, regardless of the nonmovant’s response. *Baton Rouge Oil & Chem. Workers Union v. ExxonMobil Corp.*, 289 F.3d 373, 375 (5th Cir. 2002).

When the moving party has met its Rule 56(c) burden, the nonmoving party cannot survive a motion for summary judgment by resting on the mere allegations of its pleadings. The nonmovant must identify specific evidence in the record and articulate the manner in which that evidence supports that party's claim. *Johnson v. Deep E. Texas Reg'l Narcotics Trafficking Task Force*, 379 F.3d 293, 305 (5th Cir. 2004). The nonmovant must do more than show that there is some metaphysical doubt as to the material facts. *Armstrong v. Am. Home Shield Corp.*, 333 F.3d 566, 568 (5th Cir. 2003).

In deciding a summary judgment motion, the court draws all reasonable inferences in the light most favorable to the nonmoving party. *Anderson*, 477 U.S. at 255; *Calbillo v. Cavender Oldsmobile, Inc.*, 288 F.3d 721, 725 (5th Cir. 2002). “Rule 56 ‘mandates the entry of summary judgment . . . against a party who fails to make a showing sufficient to establish the

existence of an element essential to that party’s case, and on which that party will bear the burden of proof.’” *Patrick v. Ridge*, 394 F.3d 311, 315 (5th Cir. 2004) (quoting *Celotex*, 477 U.S. at 322).

IV. Ownership

The entities in the chain-of-title for the ‘003 Patent and the ‘820 Patent, with the exception of the UNL Board of Regents, are controlled by Kothmann, the principal of KEI, KKI, and ISC. On February 8, 2000, the ‘003 Patent issued to the UNL Board of Regents. On September 20, 2000, UNL assigned all substantial rights in the ‘003 Patent to ISC. On October 30, 2000, ISC transferred its rights to KKI. On August 8, 2001, KKI filed this suit.

In April 2002, KKI merged with KEI, leaving KEI as the surviving corporation. On January 14, 2003, the ‘820 Patent issued directly to KEI as the assignee. KEI argues that the undisputed summary judgment evidence establishes its ownership of the ‘003 Patent as a matter of law. (Docket Entry No. 135). Trinity argues that the real party in interest is ISC, not KEI.

A. The Applicable Legal Standards

“A party may bring an action for patent infringement only if it is the ‘patentee,’ i.e., if it owns the patent, either by issuance or assignment.” *Speedplay, Inc. v. Bebop, Inc.*, 211 F.3d 1245, 1249–50 (Fed. Cir. 2000) (citing 35 U.S.C. §§ 100(d), 261, 281); *Mentor v. H/S, Inc. v. Med. Device Alliance, Inc.*, 240 F.3d 1016, 1017 (Fed Cir. 2001).¹⁵ “A party that has been granted all substantial rights under a patent is considered the owner and is entitled to bring an infringement action, regardless of how the parties characterize the transaction that conveyed those rights.” *Speedplay*, at 1250; *Fieldturf, Inc. v. Sw. Recreational Indus., Inc.*, 357 F.3d 1266, 1269 (Fed. Cir. 2004). The party asserting that it “has all substantial rights” in a patent from an assignment or transfer “must produce . . . written instruments documenting the transfer of proprietary rights.” *Id.* A court “must ascertain the intention of the parties and examine the substance of what was granted by the agreement. *Id.*; *Prima Tek II, L.L.C. v. A-Roo Co.*, 222 F.3d 1372, 1379–80 (Fed. Cir. 2000). State law applies to the determination of ownership rights in a patent. *Jim Arnold Corp. v. Hydrotech Sys., Inc.*, 109 F.3d 1567,

¹⁵ 35 U.S.C. § 281 provides that “a patentee shall have remedy by civil action for infringement of his patent.” Section 100(d) states that the term patentee includes “not only the patentee to whom the patent was issued but also the successors in title to the patentee.”

1572 (Fed. Cir. 1997).

B. KEI's Evidence of Ownership

KEI has submitted competent and undisputed evidence of its ownership of the '003 and the '820 Patents. ISC obtained from the UNL Board of Regents all substantial rights in the '003 Patent through a written assignment dated September 20, 2000. ISC then transferred its rights to KKI through a written assignment executed on October 30, 2000 but effective as of September 13, 2000—seven days before ISC had received title. (Docket Entry No. 135, Exs. 4, 6). The last paragraph of the document states: "EXECUTED, this 30 day of October, 2000, *but effective* the 13th day of September, 2000." (*Id.*, Ex. 6 ¶ 12). Trinity claims that because the assignment was effective before ISC held legal title, the assignment is void, and ISC is the real party in interest.

Kothmann is the sole owner of ISC, and KEI and was previously the sole owner of KKI. Kothmann signed the challenged assignment document. He testified that he did not know why he made the October 30, 2000 document effective as of September 13, 2000. (Docket Entry No. 155, Ex. 9, ll.139:13–142:4). It is undisputed that ISC held valid legal title to the '003 Patent on October 30, 2000, when Kothmann signed the document. It is clear that Kothmann intended to convey rights in the '003 Patent from ISC to KKI. The document states:

[For consideration, ISC] has agreed to and does hereby sell, assign, and transfer to [KKI], its successors and assigns, the entire, right, title, and interest [in the '003 Patent]. . . in and to [], and all reissues, renewals . . . and any divisionals, continuations, and continuations-in-part based thereon, and the inventions disclosed therein . . . including [ISC's] full right to sue for and

recover for past, present, and future infringements.

(Docket Entry No. 135, Ex. 6 ¶ 3). Kothmann is the sole owner and president of both ISC and KEI. There is no evidence to suggest that ISC or Kothmann has attempted to enforce the ‘003 Patent against Trinity so as to subject it to separate litigation for the same alleged infringement. This court concludes that the summary judgment evidence does not create a fact issue as to KEI’s ownership of the ‘003 Patent.

KEI’s motion for summary judgment as to its ownership of the ‘003 Patent is granted.

V. Infringement

Trinity argues that there is no genuine issue of disputed fact material to determining whether the MPS-350 and the TRACC infringe the ‘003 Patent, either literally or under the doctrine of equivalents. Trinity argues that no reasonable jury could find that the MPS-350 satisfies the “terminal” limitation of claims 6, 8, and 12 of the ‘003 Patent, and that no reasonable jury could find that the TRACC and the MPS-350 satisfy the “cutting means” limitation required by those claims. Trinity has moved for summary judgment that the MPS-350 and TRACC do not infringe the ‘003 Patent. (Docket Entry No. 142).

Both parties have moved for summary judgment on infringement of the ‘820 Patent. The primary dispute arises from the limitation in independent claim 3 that calls for the “cuttable member” to be “horizontally mounted between two parallel guardrails.” (Docket Entry No. 65, Ex. 5, ‘820 Patent, col. 9, ll. 31–32). Trinity moves for summary judgment, claiming that the TRACC does not literally infringe the ‘820 Patent as a matter of law because the rip plates in the TRACC are *between* the guardrails when viewed from above, but *below*

the guardrails when viewed from the side. Trinity argues that the doctrine of equivalents does not apply because KEI presumptively surrendered any equivalents to the “between” limitation during the prosecution history of the ‘820 Patent. KEI cross-moves for summary judgment that the TRACC infringes the ‘820 Patent. (Docket Entry Nos. 140, 142).

A. The Applicable Legal Standards

Patent infringement claims involve two analytic steps. *Mars, Inc. v. H.J. Heinz Co., L.P.*, 377 F.3d 1369, 1373 (Fed. Cir. 2004); *Scanner Tech. Corp. v. ICOS Vision Sys. Corp., N.V.*, 365 F.3d 1299, 1302 (Fed. Cir. 2004). First, the court determines the meaning and scope of the asserted claims. *Scanner Tech.*, 365 F.3d at 1302; *Novartis Pharm. Corp. v. Eon Labs Mfg., Inc.*, 363 F.3d 1306, 1308 (Fed. Cir. 2004). Claim construction is a matter of law. *Bai v. L & L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998). A court primarily relies on intrinsic evidence—the claims, the written specification, and the prosecution history—to learn the meaning of the terms. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc). In most cases, the best source for determining the meaning of claim terms is the specification in which the patentee describes the invention. A court may secondarily rely on extrinsic evidence, including expert testimony, dictionaries, and technical treatises, to understand the meaning and scope of particular terms. *Id.*

Second, the claims as construed are compared to the allegedly infringing device to determine whether the claims encompass the accused structure. Whether the accused device contains each element, as properly construed, is a question of fact. *Bai*, 160 F.3d at 1353. Literal infringement of a claim requires that every limitation recited in the claim appears in

the accused device, “i.e., that the properly construed claim reads on the accused device exactly.” *Cortland Line Co., Inc. v. Orvis Co., Inc.*, 203 F.3d 1351, 1358 (Fed. Cir. 2000). If even one limitation is missing or not met as claimed, there is no literal infringement. *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1313 (Fed. Cir. 2003); *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 812 (Fed. Cir. 2002). Summary judgment on the issue of literal infringement is proper “when no genuine issue of material fact exists, in particular, when no reasonable jury could find that every limitation recited in the properly construed claim either is or is not found in the accused device.” *Goldenberg v. Cytogen, Inc.*, 373 F.3d 1158, 1164 (Fed. Cir. 2004) (quoting *Bai*, 160 F.3d at 1353).

If there is no literal infringement, there still may be infringement under the doctrine of equivalents. “The doctrine of equivalents allows the patentee to claim those insubstantial alterations that were not captured in drafting the original patent claim but which could be created through trivial changes.” *Festo*, 535 U.S. at 733. Infringement under the doctrine of equivalents requires that the accused product contain each limitation of the claim or its equivalent. “An element in the accused product is equivalent to a claim limitation if the differences between the two are ‘insubstantial’ to one of ordinary skill in the art.” *Eagle Comtronics, Inc. v. Arrow Comm. Labs., Inc.*, 305 F.3d 1303, 1315 (Fed. Cir. 2002). The test for equivalence is whether the accused structure performs substantially the same function in substantially the same way to achieve substantially the same result as the claimed invention. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 40 (1997). Summary judgment of noninfringement under the doctrine of equivalents is appropriate if “no

reasonable jury could determine two elements to be equivalent.” *Leggett & Platt, Inc. v. Hickory Springs Mfg. Co.*, 285 F.3d 1353, 1360 (Fed. Cir. 2002) (quoting *Warner-Jenkinson*, 520 U.S. at 39 n.8.).

Equivalence must be determined against the context of the patent, the prior art, the prosecution history, and the nature of the technology claimed. A court may determine, as a matter of law, that the “all limitations” rule, the prior art, or prosecution history estoppel bar a patentee from asserting the doctrine of equivalents. *See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337 (Fed. Cir. 2001); *Festo*, 535 U.S. at 736; *Glaxo Wellcome, Inc. v. Impax Labs., Inc.*, 356 F.3d 1348, 1351 (Fed. Cir. 2004). The “all limitations rule” provides that the doctrine of equivalents does not apply if the doctrine would vitiate an entire claim limitation. *Lockheed Martin Corp. v. Space Sys./Loral, Inc.*, 324 F.3d 1308, 1321 (Fed. Cir. 2003). The doctrine of equivalents may not be applied “if the asserted scope of equivalency of what is literally claimed would encompass the prior art.” *Wilson Sporting Goods Co. v. David Geoffrey and Assocs.*, 904 F.2d 677, 683 (Fed. Cir. 1990) (“A patentee should not be able to obtain, under the doctrine of equivalents, coverage which he could not lawfully have obtained from the PTO by literal claims.”). Prosecution history estoppel may bar the patentee from asserting infringement under the doctrine of equivalents if the scope of the claims have been narrowed by amendment or argument during the patent prosecution. *Omega Eng’g Inc. v. Raytek Corp.*, 334 F.3d 1314 (Fed. Cir. 2003). If one of ordinary skill in the art would consider the accused product to be surrendered subject matter, the doctrine of equivalents cannot be used to claim infringement by that product. *Schwing*

GmbH v. Putzmeister Aktiengesellschaft, 305 F.3d 1318, 1324–25 (Fed. Cir. 2002).

B. The Effect of the *Phillips* Decision on This Court’s Claim Construction

In its September 2003 *Markman* order, the disputed claims that were construed included two claims that have emerged as the most important to the infringement arguments. With respect to the ‘003 Patent, the disputed term in claim 6 calls for “a terminal including an impact head.” The infringement issue is whether a “terminal” includes structures that are attached to the back of work trucks. This court construed “terminal” as:

a device (1) attached to the end of an elongated barrier that is anchored to the roadside, or (2) attached to the end of a fixed roadside hazard, that prevents an errant vehicle’s movement perpendicular to the roadway and, in cooperation with other components and the barrier or hazard, absorbs energy when a vehicle hits the terminal itself.

(Docket Entry No. 90, p. 56). With respect to the ‘820 Patent, the disputed term is the word “between” in the limitation in claims 3 and 14 requiring “an elongated cuttable member horizontally mounted between two parallel guardrails.” This court construed this limitation as follows:

The limitation “an elongated cuttable member horizontally mounted between two parallel guardrails” means that the “elongated cuttable member” must be horizontally mounted in the space that separates two parallel guardrails.

(Docket Entry No. 90, p. 58).

Long after this court issued the *Markman* order in September 2003, the Federal Circuit issued *Phillips v. AWH Corp.*, clarifying the standard for construing claims and the proper role of dictionaries, prosecution history, and expert testimony. The court recognized that

“there is no magic formula or catechism for conducting claim construction” and stressed the discussion of the invention in the specification as “the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1314–15 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “It is therefore entirely appropriate” for a court “to rely heavily on the written description [in the specification] for guidance as to the meaning of the claims.” *Id.* at 1316.

The words used in a claim are generally given their ordinary and customary meaning. *Id.* at 1313. The ordinary and customary meaning of a claim term “is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e. as of the effective filing date of the patent application.” *Id.* *Phillips* made it clear that “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* Although the claims themselves provide guidance as to the meaning of particular terms, those terms are part of “a fully integrated written instrument.” *Id.* at 1314. The *Phillips* court emphasized the specification as the primary basis for construing the claims. In addressing the role of the specification, the *Phillips* court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998):

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

415 F.3d at 1316.

In addition to the relevance prosecution history has to the specification inquiry, it continues to play an important role in claim interpretation. The prosecution history helps to demonstrate how the inventor and the PTO understood the patent. *Phillips*, 415 F.3d at 1317. But because the file history “represents an ongoing negotiation between the PTO and the applicant,” it may lack the clarity of the specification and be less useful for claim construction. *Id.* The prosecution history is nonetheless intrinsic evidence relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims.

Phillips rejected a claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The en banc court criticized the methodology adopted in *Texas Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002)—a case to which district courts often turned for guidance in claim construction—for the large role it assigned to extrinsic sources such as dictionaries and the limited role it assigned to the specification.¹⁶ According to *Phillips*, reliance on dictionary

¹⁶ The *Phillips* court rejected the approach that a claim term should be construed to encompass all dictionary definitions unless the specification or prosecution history limited the term to one particular dictionary definition. The court stated:

In effect, the *Texas Digital* approach limits the role of the specification in claim construction to serving as a check on the dictionary meaning of a claim term if the specification requires the court to conclude that fewer than all the dictionary definitions apply, or if the specification contains a sufficiently specific alternative definition or disavowal The main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words, rather than on the meaning of claim terms within the context of the patent.

definitions at the expense of the specification had the effect of “focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of the claim terms within the context of the patent.” 415 F.3d at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. What is described in the claims flows from the statutory requirement imposed on the patentee to describe and particularly claim what has been invented. *Id.* The definitions found in dictionaries, by contrast, often flow from the editors’ objective of assembling all of the possible definitions for a word. *Id.* Noting that “heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract,” the Federal Circuit directed federal courts instead to focus at the outset on how the patentee used the claim term in the claims, specification, and prosecution history. *Id.*

Phillips does not preclude all uses of dictionaries in claim construction proceedings. Instead, the court assigned dictionaries a role subordinate to the intrinsic record. Judges remain free to consult dictionaries, technical treatises, or comparable sources to assist in understanding the commonly understood meaning of words and to gain a better understanding of the underlying technology. *Id.* at 1322. Dictionaries and technical treatises may continue to inform claim construction, so long as courts do not adopt a definition that contradicts the intrinsic evidence. *Id.* at 1323. The court did not impose any particular sequence of steps for a court to follow when it considers disputed claim language. *Id.* Rather, *Phillips* held that a

Phillips, 415 F.3d at 1320.

court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant. *See Microunity Sys. Eng'g, Inc. v. Dell, Inc.*, No. 04-120, 2005 WL 2086026 at *2 (E.D. Tex. Aug. 29, 2005); *IP Innovation L.L.C. v. Sony Elecs., Inc.*, No. 04-6388, 2005 WL 2035578 at *1 (N.D. Ill., Aug. 18, 2005).

In light of the clarification provided in *Phillips*, this court has reexamined the claim construction of “terminal” and “between.”

C. The MPS-350 and the “Terminal” Claimed in the ‘003 Patent

KEI alleges that the MPS-350 infringes claims 6, 8, and 12 of the ‘003 Patent, both literally and under the doctrine of equivalents. Each of these claims calls for a “terminal.” The parties agree that the TRACC contains a “terminal,” but dispute whether the MPS-350 is a “terminal” or an equivalent structure. As a threshold matter, this court examines the construction of “terminal” in light of *Phillips*.

1. “Terminal”

In the *Markman* proceeding, KEI took the position that “terminal” was appropriately construed as a structure “attached to the end of an elongated barrier that is anchored” to prevent an impacting vehicle’s perpendicular movement, but asserted that the construction should be broad enough to include a device attached to the end of a truck or work vehicle parked in the roadway.¹⁷ KEI’s proposed claim construction defined “terminal” as a device

¹⁷ The ‘003 Patent does not define “terminal.” Trinity argued in the *Markman* hearing that the applicants for the ‘003 Patent limited their invention to guardrail systems. As originally filed, the claims of the ‘003 Patent used the term “guardrail” in describing barriers designed to redirect a vehicle away from a roadside hazard, such as oncoming traffic, or to stop a vehicle from leaving the roadway, for example, while

that attaches to the “end of an elongated barrier or other similar roadside hazard.” Trinity’s proposed claim construction defined “terminal” as “a device attached to the end of an elongated barrier. . . . A device attached to a truck or work vehicle is not a terminal.” (Docket Entry No. 90, p. 19). This court rejected Trinity’s and partially adopted KEI’s proposed construction. This court construed “terminal” as “a device attached to the end of an elongated barrier that is anchored to the roadside, or attached to the end of a fixed roadside hazard, that prevents an errant vehicle’s movement perpendicular to the roadway and . . . absorbs energy when a vehicle hits the terminal itself.” (*Id.*).

A review of the record reveals that this court’s construction of “terminal” is consistent with the interpretive principles explained in *Phillips*. The specification of the ‘003 Patent consistently describes a “terminal” as attached to structures that are anchored or fixed along the roadway. In one embodiment, the roadside obstacle is a guardrail, a longitudinal barrier, connected to the ground by posts. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 4, ll. 6–7, Figs. 1–4). In another embodiment, the roadside hazard is a “hard structure such as an overpass or the like.” (*Id.* at col. 8, ll. 5–7, Fig. 14).

In the *Markman* analysis, this court drew on definitions in the Transportation Research Board National Research Council National Cooperative Highway Research Program Report 350 (“NCHRP Report 350”). This court looked to the Report 350 as evidence of the ordinary meaning of “terminal” in the field of highway safety design. The definition of “terminal” that

crossing a bridge. In February 1997, “guardrail” was replaced with “cutable member.” The applicants did not make any amendments to the “terminal” limitation during the prosecution of the ‘003 Patent. During the prosecution of the ‘820 Patent, the word “terminal” was deleted from the claims.

this court found supported by the Report 350 is consistent with the use of the term in the patent claims and specification. Use of the Report 350 in the claim construction analysis is consistent with *Phillips*.

The NCHRP Report 350 was published by the Transportation Research Board in 1993 to provide “recommended procedures for evaluating the safety performance of various highway safety features.” (Docket Entry No. 146, Ex. 15, T00517). The Federal Highway Administration requires roadway safety devices used on the national highway system to meet performance standards set out in the NCHRP Report 350. *Id.* (“This report is recommended to highway design engineers, bridge engineers, safety engineers, researchers, hardware developers, and others concerned with safety features used in the highway environment.”).¹⁸ Dr. Sicking was an author of the report. The glossary of the NCHRP Report 350 includes the following definitions:

Crash Cushion A device designed primarily to safely stop a vehicle within a relatively short distance. A *redirective crash cushion* is designed to contain and redirect a vehicle impacting downstream from the nose of the cushion. A *nonredirective crash cushion* is designed to contain and capture a vehicle impacting downstream from the nose of the cushion.

Terminal A device designed to treat the end of a longitudinal barrier. A terminal may function by (a) decelerating a vehicle to a safe stop within a relatively short distance, (b) permitting

¹⁸ “The [Transportation Research] Board’s purpose is to stimulate research concerning the nature and performance of transportation systems, to disseminate information that the research produces, and to encourage the application of appropriate research findings. The Board’s program is carried out by more than 270 committees, task forces, and panels composed of more than 3,300 administrators, engineers, social scientists, attorneys, educators, and others concerned with transportation; they serve without compensation. The program is supported by state transportation and highway departments, the modal administrations of the U.S. Department of Transportation, the Association of American Railroads, [and] the National Highway Traffic Safety Administration . . .” (*Id.*)

controlled penetration of the vehicle behind the device, (c) containing and redirecting the vehicle, or (d) a combination of a, b, and c.

Longitudinal Barrier A device whose primary functions are to prevent vehicular penetration and to safely redirect an errant vehicle away from a roadside or median hazard. The three types of longitudinal barriers are roadside barriers, median barriers, and bridge rails.

Truck-Mounted Attenuator (TMA) An energy-absorbing device attached to the rear of a truck or utility vehicle. A TMA is designed to provide a controlled stop of a vehicle impacting the rear of the truck.

(*Id.*, T00695–96). According to the Report 350, “terminals” are only applied to the end of longitudinal barriers—roadside barriers, median barriers, and bridge rails—that are attached or anchored to the road. Such devices are distinct from energy-absorbing devices that are designed to be attached to the rear of a truck or utility vehicle. Not only are these uses of the term “terminal” consistent with the use of the term in the claims and specification of the ‘003 Patent, the Report 350 involves none of the problems in using dictionaries that the court identified in *Phillips*.

In *Phillips*, the court identified several reasons why extrinsic evidence is often considered less reliable than the intrinsic evidence of the patent itself. Extrinsic evidence “does not have the specification’s virtue of being created at the time of patent prosecution for the purpose of explaining the patent’s scope and meaning.” 415 F.3d at 1318. Extrinsic publications may not be written by or for skilled artisans in the field of art of the patent. And extrinsic evidence such as expert reports and testimony that is generated at the time and for the purpose of litigation, can suffer from bias not present in intrinsic evidence. *Id.* Dictionary

definitions can be overly broad:

The problem is that if the district court starts with the broad dictionary definition in every case and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive. The risk of systematic overbreadth is greatly reduced if the court instead focuses at the outset on how the patentee used the claim term in the claims, specification, and prosecution history, rather than starting with a broad definition and whittling it down.

Dictionaries, by their nature, provide an expansive array of definitions. General dictionaries, in particular, strive to collect all uses of particular words, from the common to the obscure. By design, general dictionaries collect the definitions of a term as used not only in a particular art field, but in many different settings. In such circumstances, it is inevitable that the multiple dictionary definitions for a term will extend beyond the “construction of the patent [that] is confirmed by the avowed understanding of the patentee, expressed by him, or on his behalf, when his application for the original patent was pending.”

Id. at 1321 (quoting *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 227 (1880)).

The NCHRP Report 350—a technical report commonly used to test highway safety devices—does not present the overbreadth problems encountered when using a general dictionary with multiple definitions. The definitions contained in the report were selected by experts in the roadside safety field, including Sicking, one of the inventors listed in the ‘003 Patent and the ‘820 Patent. The Report 350 was intended to be used by designers and engineers in the highway safety industry. The Report 350 was published in 1993, and Sicking and Pfeifer filed the application for the ‘003 Patent on November 7, 1994; the period between the two was short. The reliability concerns articulated by the court in *Phillips*—timing, audience, and bias—are not present to undermine the probative value of the definitions used

in the Report 350. Given the purpose of the Report 350, Sicking’s role as an author, and the publication date, this court’s use of the report is consistent with the rule that a claim term must be construed as it is understood by a person of ordinary skill in the art at the time the application was filed, with primary emphasis on the specification and prosecution history. The Report 350 provides contemporaneous technological context to the disputed term, “terminal,” and is consistent with the use of the term in the claims, the specification, and the file history. *See Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1315 (Fed. Cir. 2003) (“[T]he best indicator of claim meaning is its usage in context as understood by one of skill in the art at the time of invention.”). In short, the analysis used in the construction of “terminal” is not inconsistent with the court’s instruction in *Phillips*.

2. *Literal Infringement*

Sicking testified that the MPS-350 is attached to the end of a large truck “that is typically parked or moving slowly along the roadway to act as a barrier.” As Sicking acknowledged in his expert report, “[c]learly, the MPS-350 is not attached to an elongated barrier and the trucks to which it is attached are not anchored to the roadside.” Nor is a truck or work vehicle to which a MPS-350 would be attached a “fixed roadside hazard.” KEI contends that the fact that a truck is mobile does not mean that it is not “fixed,” but concedes that ordinarily, trucks are not considered “fixed.” KEI asserts that when a truck is equipped with a MPS-350 for the purpose of protecting workers in a work zone, a truck may be “fixed,” as that word is used in the field of roadside safety products.

The ‘003 Patent does not support a meaning of “terminal” that extends to a device

attached to trucks, which are clearly mobile and can readily move from place to place on the road. As described in the Background of the Invention, a “terminal” is directed to structures “intended to be positioned along the highway to reduce injury to the driver and passenger of vehicles that may accidentally tend to leave the highway.” (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 1, ll. 1–3). A work truck or utility vehicle to which the MPS-350 would attach is not “intended to be positioned along the highway” to protect the occupants of vehicles that accidentally leave the highway. As stated in the *Markman* order, the specification in the ‘003 Patent supports limiting “terminal” to a device attached to a structure that is “fixed or anchored” to the roadside. The written specification does not describe an embodiment of the invention that can be applied to a parked or slow-moving truck, which is mobile and unsecured to the ground. The specification describes structures that are secured or anchored to the ground. In one embodiment disclosed in the specification, the roadside obstacle is a guardrail—a longitudinal barrier—connected to the ground by posts. (*Id.*, col. 4, ll. 6–7, Fig. 1–4). In another embodiment, the roadside hazard is a “hard structure such as an overpass or the like.” (*Id.*, col 8, ll. 5–7, Fig. 14). The specification uses the word “fixed” in its ordinary sense. A “truck” is not securely attached to the ground or to a specific location and is not a hard structure built to remain in one place.

As noted, in construing the term “terminal,” this court drew in part on the Report 350, which separately defined “terminal” and “truck-mounted attenuator.” The ‘003 Patent does not claim a truck-mounted attenuator, but rather a terminal, which in the field of roadside safety technology is understood to refer to a different device than a truck-mounted attenuator.

This court concludes, as a matter of law, that the MPS-350 does not literally infringe the asserted claims of the ‘003 Patent.

3. *Infringement under the Doctrine of Equivalents*

Trinity argues that the doctrine of equivalents does not apply because the applicants could have sought broader coverage during the prosecution of the ‘003 Patent, but did not. Trinity argues that because the limiting potential of the claim term “terminal” with respect to a “truck-mounted attenuator” was reasonably foreseeable to the applicants, the doctrine of equivalents does not permit a finding of infringement.¹⁹ The Federal Circuit has explained that *Festo Corp.* limits the doctrine of equivalents to circumstances “in which the shortfalls of language or the unforecastability of undeveloped technology preclude or hamper claim drafting. . . . [T]he disclosure-dedication rule applies to cases in which technology is both in existence and recognizably described in the written description of the patent, yet left unclaimed.” *Toro Co. v. White Consol. Indus., Inc.*, 383 F.3d 1326, 1333 (Fed. Cir. 2004).

¹⁹ In support of the foreseeability argument, Trinity cites *Johnson & Johnston Assoc. Inc., v. R.E. Serv. Co., Inc.*, 285 F.3d 1046 (Fed. Cir. 2002) (en banc). In *Johnson*, the claims called for a “sheet of aluminum” and the specification described aluminum as “preferred” and listed other steel substrates that may be used in its place. The court held that the patentee could not recapture the subject matter disclosed in the specification but not specifically claimed. 285 F.3d at 1055–56. Judge Rader, joined by Chief Judge Mayer, endorsed the result and the reasoning of the majority opinion, and offered an “alternative reasoning.” “[T]he doctrine of equivalents does not capture subject matter that the patent drafter reasonably could have foreseen during the application process and included in claims.” *Id.* at 1070 (Rader, J., concurring); *see Festo Corp.*, 344 F.3d at 1368 (Rader, J., concurring) (“Under the foreseeability principle the doctrine of equivalents will not encompass any accessible prior art because this subject matter could have been included in the claims. On the other hand, any after-arising technology or later developments or advances would not fall within the scope of what the drafter should have foreseen and claimed.”).

KEI argues that Trinity’s argument is misplaced because the disclosure-dedication rule articulated in *Johnson* requires a finding that truck-mounted attenuators were disclosed—but unclaimed—in the ‘003 Patent. (Docket Entry No. 163, p. 8). This court agrees that the disclosure-dedication rule and *Johnson* are not controlling. That conclusion is not inconsistent with the conclusion that, as a matter of law, the doctrine of equivalents does not extend the meaning of “terminal” to encompass the MPS-350.

KEI does not argue that truck-mounted attenuators were unforeseeable undeveloped technology when the ‘003 Patent Application was filed. The asserted claims in the ‘003 Patent describe a “terminal,” a term that carries a specialized meaning in the highway safety design field. The NHRCP Report 350, written in part by Sicking, provides separate definitions for “truck-mounted attenuators” and “terminals” and discusses “terminals and crash cushions” in separate sections. (Docket Entry No. 146, Ex. 15, T00520–21). In the ‘003 Patent, it would have been simple to describe the claimed device as one that “attaches to the back of a vehicle” or to describe a “truck-mounted attenuator.” Because the inventors chose not to do so, they cannot now assert that a truck-mounted attenuator is an equivalent of the claimed “terminal.” To find that a MPS-350 infringes the device claimed in the ‘003 Patent, which requires a “terminal” attached to a “fixed” roadside hazard, would effectively read “terminal”—as that term is understood in highway safety design—out of the patent.

Even assuming that the doctrine of equivalents applied, summary judgment of no infringement is warranted. An element in an accused product is equivalent to a patent claim limitation only if the differences between the two are insubstantial to one of ordinary skill in the art. *Searfoss v. Pioneer Consol. Corp.*, 374 F.3d 1142 (Fed. Cir. 2004). The MPS-350 attaches to the back of a truck “to protect work crews from errant vehicles.” The invention claimed in the ‘003 Patent relates to guardrails (and other fixed structures) intended to be “positioned along a highway” to reduce the danger of bodily harm to the occupants of vehicles that may accidentally leave the roadway. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 1, ll. 3–5). As evidenced by the NHRCP Report 350, a person of ordinary skill in the art would not

consider the MPS-350 a “terminal” or insubstantially different from a “terminal.” This court concludes that no reasonable jury could find that a person of ordinary skill in the art would consider the MPS-350 insubstantially different from the “terminal” claimed in the ‘003 Patent.

As a matter of law, the MPS-350 does not infringe claims 6, 8, and 12 of the ‘003 Patent.

D. The “Cutting Means” Limitation in the ‘003 Patent

Claim 6 of the ‘003 Patent states that:

said cutting section including cutting means positioned to cut said cutable member as the cutable member and cutting section are moved with respect to each other by the impact head.

(*Id.*, col. 9–10, ll. 65–2). The parties agree that the “cutting means” limitation is a “means-plus-function” limitation and must be analyzed under 35 U.S.C. § 112 ¶ 6.²⁰ An accused device literally infringes a claim expressed in means-plus-function format if the accused device performs the identical function recited in the claim and is identical or equivalent to the corresponding structure described in the specification. *Lockheed*, 324 F.3d at 1320; *Kemco Sales*, 208 F.3d at 1361; *Valmont Indus. v. Reinke Mfg. Co., Inc.*, 983 F.2d 1039, 1042 (Fed. Cir. 1993) (means-plus-function format limits the applicant to the structure, material, or acts in the specification and their equivalents). The equivalence analysis requires a determination

²⁰ This court previously construed “cut” as:

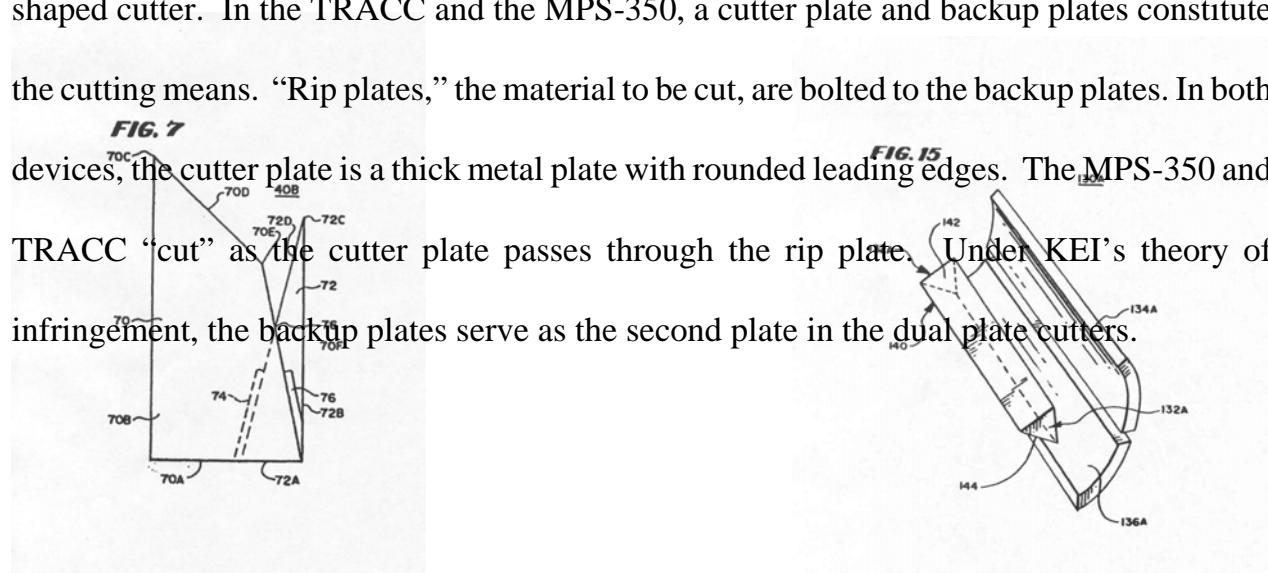
a means to cause material to fail and separate along one line, by opening the material in the Y-direction or the Z-direction, or by a combination of these two movements. “Cutting” excludes double-sided in-plane failure along an X-axis, such as buckling, compression, bending, or breaking caused by a blunt or rounded surface contacting the material at a perpendicular angle.

(Docket Entry No. 62, p. 58).

of whether the “way” the asserted equivalent structure performs the claimed function, and the “result” of that performance, are substantially different from the “way” the claimed function is performed by the corresponding structure, acts, or materials described in the specification, or its “result.” *See IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1435 (Fed. Cir. 2000). If the accused structure does not involve “after-arising technology,” a lack of equivalence under § 112 ¶ 6 precludes a finding of equivalence to establish infringement. *See Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1369 (Fed. Cir. 2001). “Although the issue of whether an accused device includes a structural equivalent under § 112 ¶ 6 claim is a question of fact, the district court may find the absence of an equivalent where “no reasonable jury could have found that the accused device has an equivalent to the disclosed structure.” *Frank’s Casing Crew & Rental Tools, Inc. v. Weatherford Int’l, Inc.*, 389 F.3d 1370, 1374 (Fed. Cir. 2004).

The ‘003 Patent specification discloses two cutting structures: a dual-plate cutter and wedge-shaped cutter. Figure 7 shows the dual- plate cutter and Figure 15 shows the wedge-shaped cutter. In the TRACC and the MPS-350, a cutter plate and backup plates constitute the cutting means. “Rip plates,” the material to be cut, are bolted to the backup plates. In both

FIG. 7
devices, the cutter plate is a thick metal plate with rounded leading edges. The MPS-350 and TRACC “cut” as the cutter plate passes through the rip plate. Under KEI’s theory of infringement, the backup plates serve as the second plate in the dual plate cutters.



1. The Dual-Plate Cutter

The dual-plate cutter and the accused structure do not perform in the same “way” and are not equivalent structures. In the ‘003 Patent, the plates in the dual-plate cutter are welded together, positioned to form an acute angle. The two plates move together as one unit, “cutting” like scissors. The dual-plate cutter contacts the cutable member at the acute angle formed by the intersection of the two plates, causing the cutable member to separate along one line. The edges of the two plates have flat, square edges and both plates apply force to “cut.” In the MPS-350 and TRACC, the cutting occurs as the rounded outside edges of the cutter plate contact the rip plates, which are held in place by the backup plates. The cutter plate applies force to one side of the rip plates; the cutter plate and backup plate do not function together. The backup plate is perpendicular to the cutting plate and is bolted to the rip plate. The backup plate does not meet the cutter plate to make the cut in the rip plate.

The MPS-350 and TRACC do not maintain the functional relationship of the cutters called for in claim 6 of the ‘003 Patent. Sicking concedes that the backup plates in the MPS-350 and TRACC do not move with respect to the rip plates and that in the claimed dual plate cutter, both cutting elements move to cut the cuttable member. (Docket Entry No. 146, Ex. 18, 1:124–1:9). If the second plate in the MPS-350 and TRACC—the backup plate—moved,

the device would not work. Claim 6 calls for a single “cutting section,” which must include the “cutting means” and which requires that the “cutting section” and the “cutable member” “move[] with respect to one another.” (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 10, l. 2).²¹ Because there is only one cutting section and the backup plates (that are part of the cutting means) do not move with respect to the rip plates (the cutable member), the claim limitation that the cutting section and cutable member move with respect to each other is not satisfied. *See Searfoss*, 374 F.3d at 1142 (patent for moveable cover system for use on a truck bed which called for direct pivotal connections for tension assembly was not infringed by the accused product which utilized indirect pivotal connections). The two plates in the MPS-350 and TRACC on one hand, and the two plates in the dual-plate cutter on the other hand, function in substantially different ways. *See Toro Co. v. Deere & Co.*, 355 F.3d 1313, 1325 (Fed. Cir. 2004) (an accused device does not infringe a means-plus-function claim, either literally or under the doctrine of equivalents, if it operates in a “substantially different way”). The doctrine of equivalents does not provide a basis for finding infringement.

2. *The Wedge-Shaped Cutter*

In the ‘003 Patent, the wedge-shaped cutter consists of a steel wedge welded to the side of the cutting section’s frame. The wedge-shaped cutter “cuts” like an axe with the leading edge contacting the “cutable member.” The wedge has a “forward pointed edge” created by two adjacent cutting sides. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 7, ll. 17–18). The

²¹ As described in claim 6, the “cutting section”—which includes the “cutting means”—is aligned with the “cutable member” and the “impact head.” When a vehicle collides with the “impact head,” the “cutting section” and “cutable member” are forced together. (Docket Entry No. 65 Ex. 1, ‘003 Patent, col. 8, ll. 10–22).

leading edge of the cutter plate in the MPS-350 and TRACC has rounded edges. The difference between rounded edges and pointed or square edges on a “cutter” are not insubstantial to a person of ordinary skill in the art. Albritton, the inventor of the MPS-350 and the TRACC, identified the importance of the rounded structure in the cutter plate. The rounded shape enhances reusability and reliability. Sharp structures dull with use; a rounded edge retains its shape. Sicking, one of the inventors of the ‘003 Patent, also acknowledged a substantial difference between rounded structures and the pointed or square edges used in the wedge-shaped cutter in the ‘003 Patent. In the ‘003 Patent prosecution history, the applicants and the PTO distinguished the type of failure produced by the blunt, rounded bolts disclosed in the Bronstad reference from the type of failure produced by the cutters claimed in the ‘003 Patent. The PTO Board of Appeals stated that “the claimed ‘cutting means’ is not readable on the bolts [] of Bronstad since the bolts [] will shred out rail material, not “cut” the rail material. (Docket Entry No. 160, Ex. 9). In distinguishing the Bronstad reference from the ‘003 Patent in this litigation, Sicking testified that the rounded splice bolts used in the Bronstad reference were “more than insubstantially different” from the cutters claimed in the ‘003 Patent, acknowledging that the rounded shape was not equivalent to the wedge-shaped cutter in the ‘003 Patent.

The Bronstad Reference also does not disclose the claimed “cutting means” because the Bronstad Reference discloses shredding splice bolts, which are not structurally equivalent to any of the alternative cutter embodiments described in the specification of the ‘003 patent, in turn because the structure of the shredding splice bolts disclosed in the Bronstad Reference is more than insubstantially different from the cutter embodiments

disclosed [] and because shredding splice bolts disclosed in the Bronstad Reference do not “cut” the guardrail sections.

(Docket Entry No. 146, Ex. 14, p. 22).

The rounded edges of the cutter plate in the MPS-350 and TRACC cut into the rip plates, pushing or stretching the metal and causing tension separation. The edge of the wedge-shaped cutter in the ‘003 Patent “shears” or “cuts” the cutable member. The record shows that to an ordinary person of skill in the art, the structural differences in the cutting element are not insubstantial differences. The Federal Circuit has recognized that a finding of noninfringement results if the specific physical features of the structure corresponding to the “means” limitation have significant relevance to the claimed invention and those features are not present in the accused structure. *IMS Tech.*, 206 F.3d at 1436 (range of equivalence depends on the extent and nature of the invention); *see V-Formation, Inc. v. Benetton Group SPA*, 401 F.3d 1307 (Fed. Cir. 2005) (doctrine of equivalents cannot be used to erase meaningful structural and functional limitations of the claim).

3. *Substantially Different Adaptability of the Claimed Cutters*

The amount of energy absorbed by the device claimed in the ‘003 Patent depends on the shape, number, and placement of the cutters. The specification identified the geometry and design of the cutters as an important advantage over the prior art because the design allowed “greater versatility” to alter the energy-absorbing rate in a particular embodiment. (Docket Entry No. 65, Ex. 1, col. 1, ll. 64–col. 2, ll. 9). The wedge-shaped cutter design allows for alteration of the adjacent sides of the wedge to create a sharper point for greater energy absorption. (*Id.*, Ex. 1, col. 3, ll. 11–16). “While three [dual shaped] cutters are

shown in Fig. 8, any other number may be selected and the spacing between them may be varied to change the amount of energy absorbed.” (*Id.*, Ex. 1, col. 3, ll. 11–16). The cutters in the ‘003 Patent are welded to the inside of the metal frame of the “cutting section” and can easily be changed without a major redesign of the other elements. The specification of the ‘003 Patent states that unlike the prior art, the claimed invention “may be easily designed for different rates of energy absorption without modifying the heavy frame structure and only modifying the cutting mechanisms themselves.” (*Id.*, Ex. 1, col. 3, ll. 19–24).²² In the MPS-350 and the TRACC, by contrast, the backup plates are part of the heavy frame structure. The cutter plate, unlike the claimed cutters, is not attached to the inside of the metal “cutting section” frame. The cutter plate, the primary cutting element, contacts the rip plates, which are held in place by the backup plates. The adaptability of this design configuration is not substantially similar to that identified in the ‘003 Patent.

In the MPS-350 and TRACC, the energy-absorbing properties are dependent on the tensile strength of the rip plates, not the design of the cutter plate. Because the cutter plate is the primary cutting structure and depends on the backup plates to hold the rip plates in place, the rip plate (the cutable member) is the only element that is easily changed. *See Franks Casing Crew*, 389 F.3d at 1379 (noting that the “undisputable mechanical incompatibility between the two devices” underscored that no reasonable jury could fail to

²² In the Background of the Invention section, the inventors distinguished prior art, including the Sicking ‘928 Patent that was the subject of the BEST Litigation. The inventors described the ‘928 Patent as follows: “the terminal, upon impact by a vehicle, moves along the rail, forcing the rail into a narrowing chute to extrude the rail and bend it into a roll” and claimed that in such a configuration it is difficult to adapt the basic design to absorb energy at different rates. (*Id.*, col. 1, ll. 40–56; col. 8, ll. 60–65).

find an unsubstantial difference between the two structures). *Ishida Co. Ltd. v. Taylor*, 221 F.3d 1310, 1316 (Fed. Cir. 2000) (an accused structure “infringes a claim element . . . only if it is insubstantially different from the corresponding structure in the patent specification.”).

4. *Conclusion as to the “Cutting Means” Limitation in the ‘003 Patent*

The accused cutters and the claimed cutters represent distinct structural approaches to “cutting.” The design configuration and the specific cutting modes of the accused cutter and the claimed cutters are more than insubstantially different. In the dual-plate cutter disclosed in the ‘003 Patent, both plates apply force to “cut.” The MPS-350 and TRACC “cut” as the cutter plate passes through the rip plate, with only the cutter plate applying force to one side of the rip plates. The wedge-shaped cutter uses a pointed wedge to cut the cutable member. In the MPS-350 and TRACC, the leading edge of the cutter plate is rounded. No reasonable jury could find that a person of ordinary skill in the art would regard the cutters in the MPS-350 and TRACC as equivalent to the “cutting means” claimed in the ‘003 Patent. There is no basis to find either literal infringement or infringement under the doctrine of equivalents.²³ This court finds, as a matter of law, that the MPS-350 and the TRACC do not infringe the asserted claims of the ‘003 Patent.

E. **The Infringement Issues as to the ‘820 Patent**

KEI asserts that the TRACC infringes claims 3, 4, 11, and 14 of the ‘820 Patent.

²³ As Trinity points out, if the accused device is not equivalent to the structure disclosed in the specification, the doctrine of equivalents provides a basis for infringement only if the accused device is new technology arising after the issuance of the patent-in-issue. *See Asyst Tech.*, 268 F.3d at 1369. The MPS-350 and the TRACC were both completed before the ‘003 Patent issued in 2000.

Claims 4 and 11 depend on independent claim 3. Claim 14 is an independent claim. The primary dispute is whether the TRACC satisfies the limitation in independent claims 3 and 14 that calls for an “elongated cuttable member horizontally mounted between two guardrails.” Specifically, the issue is whether the TRACC satisfies the “between” limitation.

During the *Markman* hearing, the parties agreed on the following constructions of an “elongated cuttable member” and “guardrail”:

An “elongated cuttable member” is a member that is capable of being cut and has length that is notably longer than its width.

A “guardrail” is the rail component of an elongated barrier that impedes the movement of an errant vehicle off a roadway and redirects the vehicle back onto the roadway.

(Docket Entry No. 90, pp. 47–48). After the *Markman* hearing, this court entered the following construction:

The limitation “an elongated cuttable member horizontally mounted between two parallel guardrails” means that the “elongated cuttable member” must be horizontally mounted in the space that separates two parallel guardrails.

(Docket Entry No. 90, p. 58). The parties filed cross-motions for summary judgment focused on whether in the TRACC, the cuttable member—the rip plates—are “between” the guardrails. (Docket Entry Nos. 140, 142). KEI does not dispute that the TRACC’s rip plates are *below* the guardrails when viewed from the side. KEI argues that “between” encompasses devices with cuttable members a few inches above or below the guardrails when viewed from the side. Trinity argues that the TRACC does not literally infringe the asserted claims of the ‘820 Patent because KEI admits that the rip plates in the TRACC are not “between” two

parallel guardrails and argues that the doctrine of equivalents does not apply. (Docket Entry No. 178). The threshold issue is a reexamination of this construction in light of *Phillips*.

1. “Between”

As noted, in the *Markman* order, this court construed “an elongated cuttable member horizontally mounted between two parallel guardrails” to mean that the “‘elongated cuttable member’ must be horizontally mounted in the space that separates two parallel guardrails.” (Docket Entry No. 90, p.49). This court concluded that the “ordinary meaning of ‘between’ includes both [horizontal and vertical] limits on the space defined by two objects.” (*Id.*). KEI had argued that the cuttable member could be above or below the guardrails when viewed from the side because the specification did not limit the term “between” to “in the space that separates” viewed both horizontally and vertically. Trinity argued that “between” meant “in the space that separates,” in both the horizontal and vertical dimensions.

KEI relied on Figure 14, which shows the crash cushion embodiment viewed from above. In Figure 14, the cuttable member is located in the space defined by the parallel guardrails in the horizontal dimension. In Figure 14, however, no information is provided as to whether the cuttable member is located above or below the guardrail edges. The description of Figure 14 states:

In FIG. 14 there is shown another embodiment of guardrail 10A serving to protect vehicles from hard structures 120 such as an overpass or the like. In this embodiment, beam 130 is horizontally mounted between two parallel rails 122 and 124, each having corresponding overlapping sections 122A-122D and 124A-124C, supported by corresponding ones of the breakaway posts 126A-126D. The structure without the terminal assembly 18 and beam 130 is similar in operation and construction as that

described in the aforementioned U.S. Pat No. 4,655,434 [to Bronstad].

(Docket Entry No. 65, Ex. 5, ‘820 Patent, col. 8, ll. 9–26). Figure 14 is the only drawing of the crash cushion embodiment and, as noted, it provides no information about whether the cuttable member is mounted between the parallel guardrails when viewed from the side, as opposed to from above. The specification states that the cuttable member must be horizontally mounted “between” the parallel guardrails, but nothing in the specification states that the cuttable member is between the guardrails when viewed from above but not when viewed from the side. The description of Figure 14 states that the embodiment is similar to the operation and construction of the device claimed in the Bronstad ‘434 Patent. In that patent, the term “between” describes the slotted material that is within the overlapping portions “in the space that separates” the top and bottom portions of the guardrail. That description is consistent with this court’s claim construction.

The claim limitations and the prosecution history undermine KEI’s reliance on Figure 14 in arguing that “between” can mean “above” or “below” the guardrails in the vertical dimension, and “in the space that separates” the guardrails in the horizontal dimension. A patentee may give a definition that departs from the ordinary meaning or that is inconsistent within the patent itself, but must do so in the claims, written description, or drawings of the patent. KEI did not do so. KEI does not contend that it acted as its own lexicographer with respect to the limitation or that “between” was used with a specialized, technical meaning or used inconsistently. To the contrary, KEI argued from the outset that “between” was used in the ‘820 Patent only in its common, ordinary meaning. (Docket Entry No. 82, p. 17).

During the prosecution of the ‘820 Patent, the examiner rejected claims directed at cutting fiber-reinforced material as obvious in light of the Bronstad ‘434 Patent, a patent issued to Sicking, and U.S. Patent No. 3,596,963 issued to Phillips. The Phillips reference disclosed the use of fiber-reinforced material within guardrails. In an office action dated January 13, 2000, the examiner stated that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the guardrail terminal of Sicking et al in view of Bronstad by forming the guardrail from fiber reinforced material, as taught by Phillips, in order to increase the rigidity of the rail.” (Docket Entry No. 148, Ex. 11, T02014). The applicants objected. With respect to the Bronstad reference, the applicants argued that it did not disclose “cutting” and that “the new claims are all directed to cutting the guardrail and thus are not properly rejectable . . . over Bronstad.” (*Id.*, T02040). With respect to the Phillips reference, the applicants argued that the examiner’s rejection was improper because it did not disclose “cutting a guardrail.” (*Id.*). The applicants limited “cuttable member” to a member that was physically mounted as part of the guardrail structure itself—horizontally mounted between the parallel guardrails—as opposed to an additional or separate structure that could be above, below, or to the side of one of the guardrails.²⁴ Narrowing claim constructions argued during prosecution history to distinguish the claimed invention from

²⁴ “Absent a clear disclaimer of particular subject matter, the fact that the inventor anticipated that the invention may be used in a particular manner does not limit the scope to that narrow context.” *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1301 (Fed. Cir. 2003). “[A] claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366–67 (Fed. Cir. 2002); *see also C.R. Bard v. U.S. Surgical Corp.*, 388 F.3d 858, 863 (Fed. Cir. 2004) (ordinary and customary meaning does not trump the intrinsic record).

prior art excludes the construction that was disclaimed, even if the examiner did not rely on the applicant’s statements in allowing the claims. The Federal Circuit has rejected the argument that statements made during prosecution about features that distinguish the claimed invention from prior art should be disregarded if the features were not expressly included in the claims. *See Springs Window Fashions LP v. Novo Indus., LP*, 323 F.3d 989, 995–96 (Fed. Cir. 2003) (“[A] reasonable competitor, reviewing the amendments and statements made by the applicant to distinguish the claimed invention from Pluber, would conclude that the claimed invention did not cover a device like Pluber’s.”); *see also Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1327 (Fed. Cir. 2002) (adopting a claim construction that excluded an embodiment when the prosecution history required the claim construction because of the disclaimer). The fact that “the prosecution shifted to a different focus [after the applicant amended the claims] does not blunt the impact of those remarks made to overcome the prior rejection.” *Desper Prods., Inc., v. QSound Labs, Inc.*, 157 F.3d 1325, 1336 (Fed. Cir. 1998).²⁵

Reexamining the claim construction under *Phillips* does not lead to the result KEI sought in the *Markman* proceeding. The specification of the ‘003 Patent does not use the word “between” in a way that alters its ordinary meaning or limits it to a horizontal dimension. *Phillips* does not forbid the use of a dictionary to articulate the ordinary meaning

²⁵ In September 2002, KEI filed the ‘755 Application as a continuation of the ‘003 and ‘820 Patents. The claims in the ‘755 Application include claims substantially identical to the asserted claims of the ‘820 Patent. In one claim, the sole difference is the addition of parenthetical language broadening the “between” limitation as “an elongated cuttable member horizontally mounted between (*when viewed from above*) two parallel guardrails.” (emphasis added). KEI does not dispute that the addition of the “when viewed from above” element broadened the scope of the ‘820 Patent claims. The Federal Circuit has noted that the prosecution history of a subsequently issued patent may be relevant for purposes of a related, previously granted patent. *See Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1349–50 (Fed. Cir. 2004) (recognizing that “the prosecution history of one patent is relevant to an understanding of the scope of a common term in a second patent stemming from the same parent application”).

so long as that meaning is not divorced from, or inconsistent with, the meaning of the claim terms in the context of the patent specification and file history. Although this court cited dictionary definitions of “between” and cited to *Texas Digital*, this court did not construe “between” to include all dictionary definitions of the term without regard to the context of the invention.²⁶

This court concludes that the claim constructions entered in September 2003 are consistent with the approach set forth in *Phillips*.

2. *Literal Infringement*

Trinity argues that because the rip plates of the TRACC are below the bottom of the guardrails, and not “between” the guardrails when viewed from the side, the TRACC does not literally infringe the ‘820 Patent. (Docket No. 178, p. 14). The parties do not dispute that the TRACC’s rip plates are “between” the guardrails—in the space that separates them—when viewed from above. The issue is whether the rip plates of the TRACC are “between” the guardrails despite the fact that, when viewed from the side, they are inches below the bottom edge of the guardrail.²⁷

²⁶ Both KEI and Trinity relied on dictionary definitions of “between” in their arguments during the *Markman* proceeding. KEI argued that the dictionary definition of a city located “between” New York and Chicago supported construing “between” as meaning “between” the guardrails if viewed from above, but not viewed from the side. This court rejected the argument and noted that when “between” is used to describe two geographical locations on a map, the respective altitudes of the locations are ignored.

²⁷ During the *Markman* hearing, KEI urged that the “horizontally mounted between” limitation imposed no vertical limit on the position of the cuttable member. This court rejected KEI’s position that the “between” imposed no vertical limits on the position of the cuttable member. In attempting to show literal infringement, KEI quotes several passages from this court’s opinion that contained the *Markman* order and argues that this court concluded that “the ordinary meaning of the term ‘between’ does not encompass cuttable members that appear to be ‘between’ the guardrails when viewed from above or below, but when viewed from the side are *far from above or below* the space separating the guardrails.” (Docket Entry No. 90, p. 50) (emphasis added). KEI argues that this court indicated that a cuttable member mounted

In the TRACC, the rip plate is the elongated cuttable member. The rip plates are mounted at the bottom of two parallel guardrails. The overall height of the TRACC is two feet, eight inches and the rip plates are located one to two inches below the bottom edge of the guardrails. The top edge of the rip plate or cuttable member is below the bottom edge of the guardrail. Sicking acknowledged in his expert report that the rip plates are not “between” the guardrail, although he emphasized that it was only inches—or less—from “being between the two parallel guardrails.” (Docket Entry No. 163, Ex. 2). Sicking also acknowledged that the TRACC does not literally satisfy the “between” limitation during his deposition. The relevant testimony follows:

Q: Isn’t it true that the rip plates are not mounted in the space that separates two parallel guardrails?

A: They’re located just below the two guardrails.

Q: So I take that to mean yes, that they are not located in the space that separates. Is that your testimony, Dr. Sicking?

A: I agree

Q: You agree that the rip plates are not horizontally mounted in the space that separates two parallel guardrails?

A: They are an insubstantial distance below the

horizontally between two parallel guardrails, yet a few inches above or below the guardrails, like the rip plates in Trinity’s TRACC, would nonetheless be considered “between two parallel guardrails.” (Docket Entry No. 140, pp. 9–10). A bit of context is appropriate here. The quoted passage responded to KEI’s proposed construction, which was specifically rejected by this court because it imposed no vertical limitation on space and would permit a structure that was far above or below the guardrails but “between them” when viewed from above. (Docket Entry No. 90, pp. 49–50). This court did not hold or suggest that “between” the guardrails means “in the space that separates the guardrails when viewed from above and either between, slightly above, or slightly below the guardrails when viewed from the side.”

guardrails, but they are below the guardrails.

Because the rip plates are below the guardrails, the rip plates are not “mounted in the space that separates two parallel guardrails.” In the TRACC, the cuttable member is outside the “space that separates” two parallel guardrails. This court concludes that as a matter of law, the TRACC does not literally infringe the asserted claims of the ‘820 Patent.

3. *Infringement Under the Doctrine of Equivalents*

Sicking’s testimony presents KEI’s argument: if there is “an insubstantial difference” between the claim language of the ‘003 and the accused device, the device may infringe under the doctrine of equivalents. Trinity asserts that under the “all limitations” rule, expanding the coverage of claims 3 and 14 to include the TRACC would vitiate the claim term “between” because the rip plates of the TRACC are *below* the guardrails. (Docket No. 178, pp. 15–16). Trinity argues that “between” is an absolute term, similar to “on and off,” “inside and outside,” and “majority and minority.” According to Trinity, the rip plates are either “between” the guardrails or they are not. *See Asyst Tech.*, 402 F.3d at 1195 (“[T]he ‘all elements rule’ provides that the doctrine of equivalents does not apply if applying the doctrine would vitiate an entire claim limitation. This case falls within both that doctrine and its corollary, the ‘specific exclusion’ principle, since the term ‘mounted’ can fairly be said to specifically exclude objects that are ‘unmounted.’”).

In *Cooper Cameron Corp v. Kvaerner Oilfield Products, Inc.*, 291 F.3d 1317 (Fed. Cir. 2002), the following claim language was at issue: “[a] well head comprising . . . a workover port extending laterally through the wall of the spool tree from *between* the two plugs.” *Id.* at 1319. In the accused device, the workover port was positioned *above* the plugs. The

Federal Circuit held that the patentee was barred from asserting infringement based on the doctrine of equivalents:

[T]he workover port in [the] accused device enters the wellhead assembly “above” the two plugs, which cannot be equivalent to a connection “between the two plugs.” Were we to ignore [the patentee’s] decision to claim in the ‘707 patent a workover port that connects to the assembly only “between” the plugs, we would vitiate that limitation and thereby run afoul of the all-limitations rule.

291 F.3d at 1322. KEI argues that this court should not rely on *Cooper* because it is improper to compare the meaning of the same term—“between”—used in two different patents in two different fields. KEI argues that the “geometries involved in the ‘between’ limitation” at issue in *Cooper* do not support Trinity’s position because the accused element in that case was not within either the horizontal or vertical space of “between.” This court agrees that any lesson drawn from *Cooper* must take into account the different inventions and fields. *Cooper* nonetheless is pertinent to the analysis because in both the patent at issue in *Cooper* and in the ‘820 Patent, the term “between” is used in its ordinary meaning. *Cooper* supports the argument that “between” is different from “above” or “below” and that the difference cannot readily be overcome by invoking the doctrine of equivalents.

Trinity presented expert testimony that the position of the cuttable member with respect to the guardrails in the ‘820 Patent as compared to the TRACC is not an insubstantial difference to a person of ordinary skill in the art. Although the claimed energy-absorption systems in the ‘820 Patent and the accused devices may produce the same result, positioning the cuttable member below the guardrails results in a substantially different functionality. Trinity’s expert witness, Dean Alberson, testified that when the elongated cuttable member

is mounted in the space that separates the two parallel guardrails, it is necessary to remove the member from the path of the vehicle during impact. The specification of the ‘820 Patent describes a deflector plate for this purpose. In the TRACC, an impacting vehicle passes over the rip plates because they are located below the bottom edge of the parallel guardrails. “This is a substantial difference to a person skilled in the art because it allows the elimination of structure necessary to deflect the rip plates away from the path of the vehicle.” (Docket Entry No. 143, Ex. 12, p. 30). Alberson further explained in his expert report that the vertical position of the cuttable member affects the ability to adjust the rate of energy of absorption and the dynamics of the material separation. Because there is no need to remove the rip plates in the TRACC from the path of an impacting vehicle, the energy absorption rate may be adjusted by adding additional rip plates. Locating the rip plates below the parallel guardrails also allows for the plates to be bolted to and supported by the metal undercarriage. Alberson explained that the “support provided to the rip plates by the C-channels [that make up the undercarriage] . . . essentially eliminates any risk of the rip plates buckling or kinking during an impact.” (*Id.* at 31).

Alberson’s testimony is consistent with the claim limitations in the ‘820 Patent. Those claims call for a specific arrangement of an “impact head,” an “angled cutter,” and an “elongated cuttable member horizontally mounted between two parallel guardrails.” The three structural elements are separate and must be arranged so that “the impact head is in operational connection with the cutter and the cuttable member” and the system is “positionable along the roadway to cooperate with the upstream portion of a roadside hazard.”

(Docket Entry No. 65, Ex. 5, ‘820 Patent, col. 9, ll. 38–39; col 10, ll. 24–25). Without the

specificity as to the placement of the three elements provided in the “operational connection” and “positionable” limitations, the claims of the ‘820 Patent do not adequately describe the invention. The *Markman* order stated in part as follows:

The “wherein” clauses provide the necessary additional specificity. The first “wherein” clause describes where the invention must be placed relative to the roadside hazard. The energy-absorption system is on the side of the road and, specifically, in a location where it can cooperate with the roadside hazard. This limitation narrows the places on the side of the road where the energy-absorption system can be placed. This is a structural limitation. The “function” described by this “wherein” limitation is “cooperation” with the upstream part of the roadside hazard. The structural aspect of the “wherein” clause is that the invention is “positionable” to provide the “cooperation” between the invention and the roadside hazard.

The second “wherein” clause recites the structural limitations specifying the relative positions of the parts comprising the claimed invention. The impact head is in “operational connection” with the cutter and cuttable member, in such a way that if a car collides with the impact head, the cutter and cuttable member will be forced together and the cutter will cut the cuttable member. The term “operational connection” describes the structural relationship among the impact head, cutter, and cuttable member that the claim requires for the cutter to perform. . . [T]he impact head, cutter, and cuttable member of claims 3 and 14 of the '820 Patent cannot be arranged in any way.

(Docket Entry No. 90, p. 54–55). The ‘820 Patent was filed as a divisional application directed at a method of avoiding bodily damage with a guardrail system. The impact head, cutter, and cuttable member must be arranged in a specific way to achieve the desired function. All three elements must be aligned with one another at a sufficient height to “cooperate” with the guardrail so as to move the guardrail out of the way of the impacting vehicle, preventing penetration of the passenger compartment of the impacting vehicle. The

“impact head” receives the impact of an errant vehicle and prevents the upstream portion of the guardrail from penetrating the vehicle. The ‘820 Patent claims require that the impact head cooperate with the guardrail to perform the function of eliminating the safety hazard posed by the upstream portion of the guardrail. If the “cuttable member” is a separate structure that is located below the guardrail, it is unclear that the impact head can perform the functional limitations required by the claims. “[T]he doctrine of equivalents is not a license to ignore or “erase . . . structural and functional limitations of the claim” *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir. 1996) (citations omitted).

KEI’s reliance on Figure 14 to argue that the cuttable member can be below the guardrail when viewed from the side, as long as it is between the guardrails when viewed from above, is not persuasive. As noted, Figure 14 simply does not show the position of the cuttable member relative to the guardrail when viewed from the side. Given the reference to the Bronstad ‘434 Patent in the description of Figure 14 and the requirement that applicants describe the invention claimed “in full, clear, concise, and exact terms,” 35 U.S.C. §112, an ordinary person of skill in the art would treat “between” as a description of the position of the elongated member in both the horizontal and vertical dimensions. Moreover, Brian Pfeifer, the coinventor of the ‘003 Patent, testified that when the application for the ‘003 Patent was filed, Figure 14 was just a concept that had not been built or tested. “[W]e just gave this overhead view, which gives the general concept that we are talking about that you put an impact head on the end of it and you force it down between these two rails. . . . [It] tells you

generally that we are going to put a member in between these protective devices and use the metal-cutting technology to absorb the energy.” Pfeifer explained that further design details were required, acknowledging that without the proper design and placement, the breakaway posts could get in the way and interfere with the operation of the system. Pfeifer’s testimony further undermines KEI’s use of Figure 14 to argue that the ‘820 Patent claims cuttable members positioned below the parallel guardrails and to argue that placing the cuttable member below the guardrails is an insubstantial design difference.

This court concludes that KEI has failed to show that the doctrine of equivalents should extend to cuttable members that are located below the guardrails. Moreover, as discussed below, KEI’s asserted range of equivalents—a cuttable member that is positioned below the guardrails—was rejected by the PTO based on prior art.

4. Prosecution History Estoppel

Trinity asserts that KEI is barred from expanding the scope of the “between” limitation under the doctrine of equivalents based on narrowing amendments KEI made during the ‘820 Patent prosecution. On December 11, 2001, KEI added fifteen new claims to the application for the ‘820 Patent. Among these claims were independent claim 24 and dependent claim 25. Claims 24 and 25 read as follows:

24. An energy-absorption system for positioning along a roadway to absorb the energy of an errant vehicle, the energy-absorption system comprising:

an impact head;

a cutter; and

a cuttable member;

wherein the energy-absorption system is positionable along a roadway to cooperate with the upstream portion of a roadside hazard; and

wherein the impact head is in operational connection with the cutter and the cuttable member such that the impact head of an errant vehicle with the impact head will cause the cutter to cut at least a portion of the cuttable member to absorb the impact energy of the errant vehicle.

25. The energy absorption system of claim 24 wherein the cuttable member is horizontally mounted between two parallel guardrails.

Independent claim 24 did not call for the “cuttable member” to be mounted in any particular position with respect to the guardrails. As Trinity points out, it is significant that the “horizontally mounted between two parallel guardrails” limitation was not recited in independent claim 24, but was recited in dependent claim 25. In an Office Action dated January 17, 2002, the patent examiner rejected claims 24 and 25 (as well as others) as anticipated by U.S. Patent No. 3,893,726 issued to Strohschein (the “Strohschein ‘726 Patent”) and as also anticipated by the Bronstad prior art reference. KEI responded to this rejection by canceling claim 24 and rewriting claim 25 in independent form. As issued, claim 25 became claim 3 of the ‘820 Patent. Trinity argues that the cancellation of claim 24 (which did not have the “between” limitation or the “two parallel guardrails” limitation), coupled with the rewriting of claim 25 (which had both limitations) into independent form, was a narrowing amendment. Trinity argues that prosecution history estoppel bars KEI from asserting infringement based on the doctrine of equivalents as to the “between” limitation. *See*

Honeywell Int'l Inc. v. Hamilton Sundstrand Corp., 370 F.3d 1131, 1141 (Fed. Cir. 2004) (en banc) (canceling a dependent claim and transferring a limitation in the cancelled claim to a new independent claim invokes the *Festo* presumption against equivalence with respect to the transferred limitation).

The Federal Circuit has identified three steps in a prosecution history estoppel determination. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 344 F.3d 1359, 1368 (Fed. Cir. 2003) (*Festo IX*)²⁸. First, the court must determine whether a narrowing amendment was made in the PTO. If the amendment was not narrowing, prosecution history estoppel does not apply. When the scope of the patent claim is narrowed during prosecution, a court must regard the patentee as having conceded an inability to claim the broader subject matter. *Festo*, 535 U.S. at 740 (“A patentee’s decision to narrow his claims through amendment may be presumed to be a general disclaimer of the territory between the original claim and the amended claim.”). The second step requires a determination of whether the narrowing amendment was related to patentability. The patentee has the burden to establish that the amendment was not made for a reason related to patentability. *Warner-Jenkinson*, 520 U.S. at 41; *Festo IX*, 344 F.3d at 1367; *Pioneer Magnetics, Inc. v. Micro Linear Corp.*, 330 F.3d 1352, 1356 (Fed. Cir. 2003) (only the prosecution history record may be considered in determining the reason for the narrowing amendment). If the patentee is unable to establish a reason unrelated to patentability for the amendment, the presumption arises that the patentee

²⁸ The Federal Circuit has referred to this particular case in different ways. In *Honeywell*, the court referred to the case as *Festo II*. 370 F.3d at 1139. However, that case, 344 F.3d 1359, itself referenced a previous Supreme Court decision as *Festo VII*. 344 F.3d at 1363. To avoid confusion, this court references the *Festo* decision appearing at 370 F.3d 1359 as *Festo IX*.

has surrendered all equivalents as to the amended limitation. *Festo IX*, 344 F.3d at 1367. The third step in the prosecution history analysis addresses the scope of the surrender and allows a patentee to rebut the presumption of total surrender. A patentee may rebut the presumption by showing: (1) that the alleged equivalent would have been unforeseeable at the time of the narrowing amendment; (2) that the reason underlying the narrowing amendment bore no more than a tangential relation to the equivalent in question; or (3) that there was “some other reason” suggesting that the patentee could not have been expected to have described the alleged equivalent. *Id.* at 1368. “[D]eterminations concerning whether the presumption of surrender has arisen and whether it has been rebutted are questions of law for the court, not a jury, to decide.” *Id.*

Each of these requirements is examined below.

(a) *A Narrowing Amendment*

When an independent claim and a narrower dependent claim are cancelled and the dependent claim is rewritten in independent form to secure the patent, the result is a narrowing amendment for the purpose of prosecution history estoppel. *Honeywell*, 370 F.3d at 1142. In *Honeywell*, the patent examiner rejected the independent claims in the application as obvious in view of the prior art. Honeywell cancelled the rejected independent claims and then rewrote the narrower dependent claims into independent form. The court concluded that Honeywell had surrendered any range of equivalents with respect to the limitations that were not present in the cancelled independent claim and were present in the rewritten claim. The court explained:

A presumption of surrender [] arises if rewriting the dependent claims into independent form, along with canceling the original independent claims, constitutes a narrowing amendment. Honeywell argues that prosecution history estoppel cannot occur where a dependent claim is merely rewritten into independent form. Honeywell contends that, although it surrendered its broader independent claims, there is no presumption of surrender because the scope of the rewritten claims themselves has not been narrowed. We disagree. . . . [T]he proper focus is whether the amendment narrows the overall scope of the claimed subject matter.

Id. at 1141; *accord Festo*, 535 U.S. at 736. Because KEI rewrote dependent claim 25—with the “between” limitation—into independent form and cancelled independent claim 24—which did not contain the limitation—the first step in the prosecution history estoppel analysis is met.

(b) *Whether the Amendment was Related to Patentability*

The amendment at issue was made in response to the patent examiner’s rejection of the claims as anticipated. Because the prosecution history record shows that the amendment was made for reasons related to patentability, the second step in the prosecution history analysis is met.

(c) *Whether KEI has Overcome the Presumption of Surrender*

As noted, a patentee may rebut the presumption in one of three ways. KEI has not provided evidence showing that “at the time of the amendment one skilled in the art could not reasonably be expected to have drafted a claim that would have literally encompassed the alleged equivalent.” *Festo*, 535 U.S. at 741. The relevant time for evaluating foreseeability is when the narrowing amendment was made. Trinity began selling the TRACC in 1999, long

before the amendment was submitted to the PTO on July 27, 2002. KEI filed this suit on August 8, 2001 and the preliminary injunction hearing in this case was held in April 2002. KEI cannot assert that the TRACC product, which it claims is an equivalent, was unforeseeable when it filed the amendment. KEI has failed to present evidence that could overcome the presumption under the first rebuttal criterion. *See Festo IX*, 344 F.3d at 1369 (“[i]f the alleged equivalent were known in the prior art in the field of the invention, it certainly should have been foreseeable at the time of the amendment.”).

As to the second rebuttal criterion, KEI argues that the amended claim language, “the cuttable member is horizontally mounted between two parallel guardrails,” is merely tangential to the position of the rip plates in the TRACC. KEI argues that the applicants amended claim 25, incorporating the limitations from independent claim 24, to overcome the Strohschein reference cited by the examiner. The Strohschein ‘726 Patent discloses a “vehicle bumper mechanism for absorbing the shock of a collision, which is suitable for use as both a front and rear vehicle bumper.” (Docket Entry No.177, Ex. 5).²⁹ The examiner’s office action rejecting the claims stated: “[a]s concerns claim 24, Strohschein sets forth an energy

²⁹ The description of the Strohschein bumper mechanism is helpful:

The bumper support members 15 and 16 are telescopically engaged with the chassis longitudinal member 21 so that the bumper support members 15 and 16 may slide longitudinally in engagement with chassis longitudinal member 21. . . . [A] shear knife is mounted to the chassis member 21 by means of a pin 25. . . . [T]he shear knife shears a section 15A of the support member 15 as the bumper support 15 is driven back towards the vehicle, with the force of the shearing action and of the bending action of the laminated strip 15A of the bumper support member absorbing energy of collision.

(Docket Entry No. 177, Ex. 5, col. 2, ll. 4–34).

absorption system comprising an impact head[]; a cutter[]; and a cuttable member []. As concerns claim 25, Strohschein sets forth the cuttable member horizontally mounted between two parallel guardrails (viewed as opposite sides of member [].”). The examiner further noted that the Strohschein reference disclosed pipe as the cuttable member and disclosed a deflector positioned to bend the cuttable member. Because the Strohschein reference did not disclose guardrails, KEI asserts that the narrowing amendment was not related to whether “between” encompasses a cuttable member that is between guardrails when viewed from above, but below guardrails when viewed from the side. KEI cites to the “remarks” portion of its July 27, 2002 response in support of its argument that the amendment was unrelated to the “between” limitation. The response states that the ““726 [Strohschein Patent] cited by Examiner does not disclose or teach a ‘guardrail’ singularly or in combination with other elements of an energy absorbing system.” As Trinity points out, application claim number 35, which became claim 14 of the ‘820 Patent, required the “cuttable member” to be “mounted horizontally between the two parallel guardrails.” The examiner did not reject this claim as anticipated by the Strohschein prior art reference. (Docket Entry No. 157, Exs. 22, 23). The Strohschein reference discloses a cuttable member that is separate and distinct from the surrounding guardrails.

Claims 24 and 25 were also rejected as anticipated by the Bronstad ‘434 Patent. The examiner stated that with respect to claim 24, Bronstad disclosed an energy-absorption system comprising an impact head, a cutter, and a cuttable member. With respect to claim 25, “Bronstad sets forth the cuttable member horizontally mounted between two parallel

guardrails.” (*Id.*). The applicants cited to the PTO Board of Appeal’s decision that the “cutting means” claims in the ‘003 Patent were patentable over Bronstad and submitted that “Bronstad likewise does not disclose a ‘cutter.’” (*Id.* at T02172). Notably, the response does not mention the limitation that the cuttable member be mounted “between” the parallel guardrails.³⁰

KEI has not presented evidence showing the reason for the amendment containing the “between” limitation bore no more than a tangential relation to the accused equivalent in this case. *See Festo IX*, 344 F.3d at 1371–72 (“Because the prosecution history reveals no reason for the ‘magnetizable’ amendment . . . Festo has not shown that the rationale for [that] amendment was only tangential to the accused equivalent.”). KEI surrendered the claimed range of equivalents with respect to the “between” limitation. “[T]he surrendered subject matter is defined by the cancellation of independent claims that do not include a particular limitation and the rewriting into independent form of dependent claims that do include that limitation.” *Honeywell*, 370 F.3d at 1142. This court concludes that KEI has failed to overcome the presumption under the second rebuttal criterion.

The third method of overcoming the presumption that prosecution history estoppel bars equivalents does not apply in this case. KEI did not offer “some other reason suggesting that [it] could not reasonably be expected to have described the insubstantial substitute in question.” *Festo*, 535 U.S. at 741; *Festo IX*, 344 F.3d at 137 (noting that the third criterion

³⁰ This court also notes that the prosecution history file contains the examiner’s Notice of References Cited in response to the December 11, 2001 amendments. The references include the 5,947,452 Patent that discloses the MPS-350 and the 6,923,727 Patent that discloses the TRACC.

“must be a narrow one”).

This court concludes that prosecution history estoppel bars application of the doctrine of equivalents with respect to the “horizontally mounted between” limitation in independent claims 3 and 14. Having also found no disputed fact issue as to literal infringement, this court grants Trinity’s motion for summary judgment that the TRACC does not infringe the ‘820 Patent.

VI. The Written Description Requirement

Trinity argues that the asserted claims of the ‘003 Patent and the ‘820 Patent are invalid for lack of an adequate written description, as required by 35 U.S.C. § 112. Trinity asserts that the specification does not provide an adequate written description of the variously-spelled claim term that replaced “guardrail”—“cutable member” in the ‘003 Patent and “cuttable member” in the ‘820 Patent. Trinity also argues that the applicants impermissibly broadened the scope of “cutting means” when they submitted new drawings of the wedge-shaped cutter embodiment eighteen months after filing the application for the ‘003 Patent.

A. The Applicable Legal Standards

A patent specification must contain a “written description” of the invention. 35 U.S.C. § 112.³¹ The “written description” requirement serves a teaching function, a *quid pro quo* for

³¹ Section 112 provides, in relevant part, that:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

excluding the public from practicing the invention for the patent term, and a policing function, “to prevent an applicant from later asserting that he invented that which he did not.” *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1330 (Fed. Cir. 2003); *Univ. of Rochester v. G.D. Searle & Co., Inc.*, 358 F.3d 916, 922 (Fed. Cir. 2004). As one court has stated:

The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language.

Chiron Corp. v. Genetech, Inc., 363 F.3d 1247, 1253 (Fed. Cir. 2004) (quoting *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983)). As a corollary, any amendment to a patent application must not contain any “new matter,” that is, matter describing a different invention or adding to or changing the nature of the invention disclosed in the specification. 35 U.S.C. § 132(a); *Festo.*, 535 U.S. at 731 (“What is claimed by the patent application must be the same as what is disclosed in the specification. . . .”); *Regents of Univ. of N.M. v. Knight*, 321 F.3d 1111, 1121 (Fed. Cir. 2003).

A patent applicant is required, at the close of his specification, to “particularly point [] out and distinctly claim[] the subject matter the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 2 (2000). The claims delineate the scope of the invention. *Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1379 (Fed. Cir. 2005). The definiteness requirement ensures that

35 U.S.C. § 112, ¶ 1 (2000). The “written description” requirement is distinct from the best mode requirement and enablement. *Univ. of Rochester*, 358 F.3d at 921.

the claims use language that adequately notifies the public of the patentee's right to exclude. *Honeywell*, 341 F.3d at 1338. "The statutory requirement of particularity and distinctness in claims is met only when [the claims] clearly distinguish what is claimed from what went before in the art and clearly circumscribe what is foreclosed from future enterprise." *United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942); *see also Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470 (Fed. Cir. 1993). "The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent, so that interested members of the public, e.g., competitors of the patent owner, can determine whether or not they infringe." *All Dental Prodx, LLC v. Advantage Dental Prods.*, 309 F.3d 774, 779–80 (Fed. Cir. 2002).

"Definiteness" does not require absolute clarity; only claims "not amenable to construction" or "insolubly ambiguous" are indefinite. *See Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001); *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1353 (Fed. Cir. 2003). The definiteness of claim terms depends on whether those terms can be given any reasonable meaning under general principles of claim construction. *See Oakley, Inc. v. Sunglass Hut Int'l*, 316 F.3d 1331, 1340–41 (Fed. Cir. 2003). In deciding validity, a court cannot import a limitation into the claim that the applicant deleted or failed to include in the claim language. *See Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1349 (Fed. Cir. 2002) (a court does not "rewrite [indefinite] claims to preserve their validity").

An applicant is entitled to claim the benefit of the filing date of the parent application for continuation and divisional applications only to the extent that the parent application discloses the subject matter claimed in the subsequent application. *Chiron*, 363 F.3d at 1253; 35 U.S.C. §§ 120, 121.³² Divisional applications are by definition based on the same written description as the original application. Such applications must comply with the written description requirement as well as with the restriction on new matter. *See Transco Prods. Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 555 (Fed. Cir. 1994) (“A ‘divisional’ application . . . is one carved out of an earlier application . . . [It] claims only one or more, but not all, of the independent inventions of the earlier application.”).

Although compliance with the written description requirement involves fact questions, a court may grant summary judgment if the nonmovant cannot show, by clear and convincing evidence, that the patent does not adequately describe the invention to a person of ordinary skill in the art. *Amgen*, 314 F.3d at 1330–31; *Moba*, 325 F.3d at 1319. Because “[a] patent shall be presumed valid,” 35 U.S.C. § 282, the party challenging a patent must prove the facts supporting a determination of invalidity by clear and convincing evidence. *Apotex USA, Inc.*

³² Section 121 provides that “a divisional application which complies with the requirements of section 120 of this title [] shall be entitled to the benefit of the filing date of the original application.” 35 U.S.C. § 121. Section 120, in turn, requires common inventorship between the original application and the divisional application and compliance with the written description requirement in section 112. Section 120 states in relevant part as follows:

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, . . . which is filed by an inventor or inventors named in the previously filed application shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of . . . the first application . . .

v. Merck & Co. Inc., 254 F.3d 1031, 1036 (Fed. Cir. 2001).

B. Analysis

The prosecution history shows that although the applicants initially limited their claims to a device used to cut a “guardrail,” in February 1997, the applicants broadened the claims by filing an amendment changing “guardrail” to “cutable member.” The asserted claims of the ‘003 Patent are directed to devices with a “cutting means” to cut a “cutable member.” The asserted claims of the ‘820 Patent are directed to embodiments of energy-absorbing devices with an “angled cutter” that cuts a “cuttable member.” The issue is whether the claims are invalid for lack of a written description of “cutable member” and “cutting means.”

1. *Cutable Member*

The original application for the ‘003 Patent was directed to cutting a “guardrail,” not cutting a “cutable member.” On February 5, 1997, the term “guardrail” was replaced with “cutable member,” a term that is neither used nor defined in the ‘003 Patent. The specification and preferred embodiments in both the ‘003 and ‘820 Patents refer to “guardrails.” Trinity points out that this amendment was submitted shortly after Dean Sicking attended a presentation by James Albritton on the design and operation of the MPS-350 in January 1997. “While it is legitimate to amend claims or to add claims to a patent application purposefully to encompass devices or processes of others, there must be support for such amendments or additions in the originally filed specification.” *PIN/NIP, Inc. v. Platte Chem. Co.*, 304 F.3d 1235, 1247 (Fed. Cir. 2002). Trinity asserts that this case presents a “textbook example” of an applicant impermissibly claiming a genus of subject matter based on a

specification that discloses only one or a few species within that genus. Trinity argues that the applicants described a species of energy-absorbing systems that cut a guardrail to claim a genus of a “cutable member.”

Trinity cites *Tronzo v. Biomet*, 156 F.3d 1154 (Fed. Cir. 1998), which involved a patent for a hip prosthesis. The original claims of the parent patent application were directed to a “cup” of a conical shape for a portion of the prosthesis. The asserted claims of the later patent were generic as to the shape of the “cup.” The specification described only a conical shape for the “cup” portion of the prosthesis.³³ The defendant argued that the asserted claims of the later patent were not entitled to the priority date of the parent patent because that patent application disclosed only two cup shapes, both of which were conical. The patentee argued that the parent patent specification only had to describe a sufficient number of species of cups to support the generic claim. The Federal Circuit agreed with the defendant that the later patent was not entitled to the earlier filing date of the parent patent because the specification did not adequately describe a genus of cup shapes. *Tronzo*, 156 F.3d at 1159 (“the [parent] application discloses *only* conical shaped cups and nothing broader”). The court noted that the specification did not identify other, equally functional shapes or describe a range of

³³ The parent patent described the cup limitation as follows:

The cup 12 is inserted into a bore or hole 14 in the patient’s hip bone 10. The cup has a plurality of longitudinally extended fins (24, 26, and 28) that allow the cup to grip beyond the bore 14 and to lock the prosthesis in place. Once the cup is in place, the fins provide additional resistance to the rotation of the cup and allow bony ingrowth into areas not necessarily found in other systems.

shapes. *Id.* This case is similar to *Tronzo* in that all the disclosed embodiments describe a particular shape for the claimed structure—the drawings in the ‘003 Patent and the ‘820 Patent all show elongated members supported by vertical posts—but unlike *Tronzo*, in this case the claims cover “cutable members” without any limit on the shape.

Trinity also cites to *In re Curtis*, 354 F.3d 1347 (Fed. Cir. 2004), a case involving a patent for dental floss. The issue was whether the asserted claims reciting generic “friction enhancing coatings” were entitled to the filing date of a parent patent that claimed the use of a microcrystalline wax coating. The originally-filed application did not disclose other suitable coatings or waxes that would work in the claimed invention. The court held that the patentee was not entitled to the filing date of the parent patent because that application “did not provide an adequate written description of the later-claimed genus of friction enhancing coatings.”

Id. at 1352. The Federal Circuit affirmed, stating:

[A] disclosure that names one species encompassed within a genus will adequately describe a claim directed to that genus only if the disclosure “indicates that the patentee has invented species sufficient to constitute the genus.” . . . [A] patentee will not be deemed to have invented species sufficient to constitute the genus by virtue of having disclosed a single species when, as is the case here, the evidence indicates ordinary artisans could not predict the operability in the invention of any species other than the one disclosed.

Id. at 1358.

Trinity argues that the specification in the ‘003 and ‘820 Patents provides “no guidance” to a person of ordinary skill in the art as to “cuttable members.” The shared

specification does not define or use the word “cutable member” or “cuttable member.”³⁴

Trinity emphasizes that the original application was directed to an invention that cuts a “guardrail” and that the specification does not describe the properties or characteristics that a cuttable member must have to operate properly in the invention, such as avoiding buckling.

See Enzo v. Biochem, Inc. v. Gen-Probe Inc., 323 F.3d 956, 969 (Fed. Cir. 2002)

(“Articulation of the written description requirement in terms of ‘possession’ is especially meaningful when a patentee is claiming entitlement to an earlier filing date under 35 U.S.C. §§ 119 or 120 . . . , and in *ex parte* applications in which a claim at issue was filed subsequent to the application.”).

It is undisputed that there are a large number of materials “capable of being cut” that would not work in the claimed invention. During his deposition, Sicking acknowledged that cheese, paper, cables, ropes, and thin flat sheets are all materials that are “capable of being cut” but that would not work in the claimed invention. Trinity’s expert witness defined a person of ordinary skill as one with a “B.S. degree in civil or mechanical engineering [who has] concentrated on the structural mechanics and structural design aspects of those degrees.”

Such a person would understand that a “cutable member” described only materials capable

³⁴ As noted, the ‘003 Patent recites “cutable member” and the ‘820 Patent recites “cuttable member.” During the *Markman* hearing, the parties agreed that the “elongated cuttable member” limitation is a member that is “capable of being cut and has a length that is notably longer than its width.” (Docket Entry No. 90, p. 44 & n.9). Both parties treat this construction as applicable to the ‘003 Patent and the ‘820 Patent. Claim terms that derive from the same application are to be interpreted consistently in both patents. *NTP, Inc. v. Research in Motion*, 392 F.3d 1336, 1344 (Fed. Cir. 2004); *Epcon Gas Sys. Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1031 (Fed. Cir. 2002) (“The same term or phrase should be interpreted consistently where it appears in claims of common ancestry.”); *see also Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320, 1329 (Fed. Cir. 2000) (district court is “not bound by the examiner’s finding in [an] *ex parte* application proceeding that the new claims were supported by the specification, particularly in light of the fact that the court heard extensive evidence on the issues in an adversary hearing, none of which was before the patent examiner”).

of being cut that would be operable in the device claimed. The specification of the ‘003 and ‘820 Patents describes the cutting of guardrails “of any suitable type” and structural pipes. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 4, ll. 21; Ex. 5, ‘820 Patent, col. 4, ll. 21). The preferred embodiment discloses a conventional W-beam guardrail supported by wood posts. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 4, ll. 21; Ex. 5, ‘820 Patent, col. 4, ll. 21). Figure 14 shows an embodiment in which “instead of a W-beam, a structural pipe may be used to cooperate with the terminal to absorb energy.” (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 8, ll. 9–11; Ex. 5, ‘820 Patent, col. 8, ll. 12–14).

Sicking testified that for the claimed invention to work, the material to be cut must have a certain amount of buckling resistance. Sicking identified unsupported lengths, moments of inertia, module elasticity, and thickness as factors that determine buckling resistance. Sicking agreed with Trinity’s expert witness that classic procedures for determining the buckling strength of structural elements are not accurate for shorter lengths and acknowledged that in some cases, a computer-based dynamic buckling analysis would be required to determine whether a particular member “capable of being cut” would be operable in the invention claimed in the ‘003 and ‘820 Patents.³⁵ Trinity cites Sicking’s acknowledgments in support of its argument that the patents are invalid for lack of a written

³⁵ “Designers with ordinary skill in the art would quickly recognize that a dynamic buckling analysis is required to evaluate the strength of a cuttable member and would be familiar with one of the finite element programs normally utilized to conduct such analysis. Although LS-Dyna is probably the most widely used computer program for such analysis, there are a number of other explicit finite element programs . . . capable of accurately predicting dynamic buckling load . . . Inclusion of detailed descriptions of the sizes, shapes, and material combinations with sufficient buckling strength to be used in the devices described in the ‘003 Patent and the ‘820 Patent would have greatly complicated the specification. Further, it is impractical to expect that even the most detailed description of possible cuttable member compressive strengths would preclude the need for a least a simple [] analysis.”

description.

Compliance with the written description requirement is essentially a fact-based inquiry that will “necessarily vary depending on the nature of the invention claimed.” *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991). In the field of highway safety design, there is a strong correlation between the structure and function of materials used in roadside barriers designed to redirect an errant vehicle, such as guardrails. Sicking explained that if the member to cut has sufficient vertical support, from posts or other stiff structures attached along its length, there would be no need to perform a buckling analysis, and a person of ordinary skill in the art would know the standard spacing on guardrail posts. The written description requirement may be met by a description of actual reduction to practice, detailed drawings, or diagrams. *See Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997). The common specification of the ‘003 and ‘820 Patents contains drawings of elongated rails, W-beams, or structural pipes between guardrails that are supported by vertical “breakaway” posts. (Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 6, ll. 15–17; col. 4, ll. 1–6; Ex. 5, ‘820 Patent, col. 8, ll. 15–18). Whether a certain material is both capable of being cut and likely to be operable in the device claimed would usually be known by a person of ordinary skill in highway design. The “cutable member” limitation does not make the claims invalid for lack of a written description.

2. *Cutting Means*

During the prosecution of the ‘003 Patent, the applicants submitted a hand-drawn Figure 15 showing the end view of a wedge-shaped cutter. On January 27, 1995, the

applicants submitted a formalized version of the original figure. On June 3, 1996, the applicants filed a final version of Figure 15 that shows a three-dimensional view of a wedge-shaped cutter. Trinity argues that the final version of Figure 15 added new subject matter to the original specification and amended the scope of the claimed “cutting means.” Specifically, Trinity claims that the written description provides no basis for the specific geometry shown in Figure 15, which shows “curved deflector plates curving inward.” Trinity asserts that inward curving plates conflict with the description of Figure 15, which describes deflector plates that direct the rail fragments “away from the cutting edge.” KEI disputes Trinity’s interpretation of the specification and argues that Figure 15 was a clarifying addition that shows the deflector plates described in the originally-filed specification. The specification describes Figure 15 in part as follows:

In FIG.15, there is shown a simplified embodiment 130A of a cutter of the type shown in FIG. 9 . . . having a cutting edge 140 adapted to receive a beam and two adjacent cutting sides 142 and 144 to split the rail. The rail fragments are deflected in opposite directions and fragmented by the deflector plates 134A and 136A which tend to bend them away from the cutting edge 140, causing fracturing of the brittle material by breaking in tension, cracking in compression and buckling. The amount of energy absorbed is determined by the size and angle of the cutting edge 140 and sides 142 and 144 and by the position and shape of the deflector plates 134A and 136A.

(Docket Entry No. 65, Ex. 1, ‘003 Patent, col. 8, ll. 24–37).

The specification describes what is shown in the final version of Figure 15. “[T]he disclosure as originally filed does not have to provide in *haec verba* support for the claimed subject matter at issue.” *Crown Operations Int’l, Ltd. v. Solutia Inc.*, 289 F.3d 1367, 1376

(Fed. Cir. 2002). The corresponding structure for a means-plus-function patent claim can be found in drawings, the abstract, or the written description. Claims are not necessarily limited to drawings or descriptive phrases viewed in isolation. *See generally Playtex Products, Inc. v. Procter & Gamble Co.*, 400 F.3d 901, 909 (Fed. Cir. 2005) (rejecting accused infringer's argument that a means-plus-function was restricted to the drawing of the structure, notwithstanding its broader description); *Ferguson Beauregard, Logic Controls v. Mega Sys., L.L.C.*, 350 F.3d 1327, 1338 (Fed. Cir. 2003) (scope of a claim may be determined by reviewing a variety of sources, including the drawings and written description). The examiner allowed the figure and did not issue a new matter objection. The Federal Circuit has held that "the fact that the Patent Office allows . . . an amendment without objection thereto as new matter . . . is entitled to an especially weighty presumption of correctness." *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1574–75 (Fed. Cir. 1993) (citations omitted). Although the specification does not use words to describe the exact geometry of the three-dimensional Figure 15, this court cannot conclude, as a matter of law, that the figure constitutes "new matter."

This court concludes that the '003 and '820 Patents are not invalid for failure to meet the written description requirement.

VII. Anticipation

Trinity has moved for summary judgment that claims 6, 8 and 12 of the '003 Patent and 3, 4, 11, and 14 of the '820 Patent are invalid as anticipated by prior art. The validity analysis is performed on a claim-by-claim basis. *See Amazon.com, Inc. v. Barnesandnoble.com, Inc.*,

239 F.3d 1343, 1351 (Fed. Cir. 2001). Trinity argues that claims 6, 8, and 12 of the ‘003 Patent are anticipated by U.S. Patent No. 3,847, 252 issued to Casciola on November 12, 1974 and that claims 3, 4, 11, and 14 of the ‘820 Patent are anticipated by the Gertz ‘484 Patent. In July 2002, KEI disclosed the Gertz reference during the prosecution of the ‘820 Patent Application by filing an IDS, along with a continuation application and an amendment, with the PTO. In October 2003, shortly after this court’s *Markman* order was filed, KEI submitted another IDS, which disclosed the Casciola reference, and filed a continuation application and request for continued examination of the ‘755 Application. In that request, KEI asked to resubmit the previously allowed claims for the examiner to review in light of previously undisclosed prior art and materials from this litigation. (Docket Entry No. 205, Ex. C).

In January 2005, KEI filed a supplemental brief in response to Trinity’s motion for summary judgment on invalidity to inform this court of the PTO’s recent allowance of the claims in the ‘755 Application. KEI argued that the allowance shows that the asserted claims of the ‘003 and ‘820 Patents are valid. With respect to anticipation, KEI specifically argued that Trinity’s motion should be denied in view of the examiner’s decision to allow the claims in the ‘755 Application after disclosure of the Casciola reference. Trinity responds that the allowance is irrelevant to the invalidity argument because the claims of the ‘755 Application are different from the asserted claims of the ‘003 and ‘820 Patents and the examiner’s decision to issue the notice of allowance was based on an incomplete record as a result of KEI’s failure to disclose material information to the PTO.³⁶ (Docket Entry No. 205).

³⁶ KEI relies on a comparison between claim 21 of the ‘755 Application and claim 6 of the ‘003 Patent. Because claim 21 is broader than claim 6, KEI argues that this court should treat claim 6 as though

A. The Applicable Legal Standards

A patent is presumed valid and evidence of invalidity must be clear and convincing.

Whether a patent is invalid as anticipated is a two-step inquiry. The first step requires construing the claim. The second step compares the claim to the prior art. *Power Mosfet Techs. L.L.C. v. Siemens AG*, 378 F.3d 1396, 1406 (Fed. Cir. 2004); *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1363 (Fed. Cir. 2004). Section 102 of the Patent Act lists the following conditions for patentability:

A person shall be entitled to a patent unless—

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States

35 U.S.C. § 102(a)–(b). A patent claim is invalid as anticipated if every element or limitation recited in the claim is disclosed or inherent in a single prior art reference or event. *See Acromed Corp. v. Sofamor Danek Group, Inc.*, 253 F.3d 1371, 1383 (Fed. Cir. 2001). “[A] prior art reference may anticipate when the claim limitation or limitations not expressly found

it had been allowed over the Casciola ‘252 Patent. KEI does not, however, address the fact that the IDS citing Casciola was submitted after the examiner had issued a notice of allowance. In February 2005, KEI objected to Trinity’s interrogatories that asked for information about the ‘755 application on the basis that this court did not have jurisdiction over the pending claims and the validity or enforceability of the claims was not an issue in this case. KEI’s answer stated that Trinity’s interrogatories sought information that is “not relevant to any present claim or defense.” (*Id.*, Ex. D, p. 11). Trinity argues that KEI’s own admissions and the case law preclude consideration of the allowance of the claims of the ‘755 Application with respect to the validity of the asserted claims of the ‘003 and the ‘820 Patents. *See Amazon.com*, 239 F.3d at 1351.

in that reference are nonetheless inherent in it.” *Id.* (quoting *Atlas Powder Co. v. Ireco, Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999)). Prior art anticipates only when the disclosure of the elements of the patent claim is enabling to a person skilled in the relevant art. *Elan Pharms., Inc. v. Mayo Found. for Med. Educ. & Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003).

Anticipation is a question of fact. *See Schumer v. Lab. Computer Sys., Inc.*, 308 F.3d 1304, 1315 (Fed. Cir. 2002) (“Typically, testimony concerning anticipation must be testimony from one skilled in the art and must identify each claim element, state the witnesses’ interpretation of the claim element, and explain in detail how each claim element is disclosed in the prior art reference.”). “Where the PTO has considered a piece of prior art, and issued a patent notwithstanding that prior art, a court owes some deference to the PTO’s decision.” *Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1572 (Fed. Cir. 1992).

B. The ‘003 Patent

The Casciola ‘252 Patent discloses “energy-absorbing assemblies of the type which are particularly adapted to absorb the impact of a moving body such as a moving vehicle.” (Docket Entry No. 164, Ex. 3, col. 1, ll. 12–15). The Casciola reference discloses a cylinder-shaped casing that contains a “deformable means” and a set of “fins” with wedge-shaped “tapered edges” that cut the deformable means to dissipate energy. On impact, the fins are pushed into the deformable means. The deformable body is deformed into a “free space” inside the cylinder casing. (*Id.*, col., 2, ll. 20–50). The Casciola ‘252 Patent specification states in part as follows:

The deforming means and the deformable means are coaxially arranged with the bar extending through an axial bore which is formed in the cylindrical body and a displacing means is operatively connected to the device for displacing the deforming means and the deformable means one with respect to the other along their common axis in a direction which pushes the fins into the body The displacing means in the illustrated example is constituted in part by the element which is connected with the casing so as to at through the latter on the body to tend to displace the latter upwardly This part of the displacing means may take the form of an elongated chain, for example, connected to the [casing] and anchored to any suitable structure.

(Docket Entry No. 162, Ex. 3, col., 1, ll. 49–65). The Casciola ‘252 describes the invention as useful to absorbing kinetic energy in three types of emergency situations: “a falling body such as an elevator”; “a train which does not stop within the required distance”; and “a vessel such as a ship” that collides with a pier. (*Id.*, col. 5, ll. 59–66, col. 6, ll. 7–10).

KEI argues that the Casciola ‘252 Patent does not disclose the “terminal” limitation of claim 6 of the ‘003 Patent. The Casciola ‘252 Patent specification states that “Fig. 7 shows an embodiment of the invention where the deforming means . . . extends upwardly beyond the body . . . through the top end of the casing . . . which in this case is supported by any robust stationary support means as shown at the lower end of Fig. 7. . . .” (*Id.*, col. 5, ll. 41–45). KEI argues that Figure 7 shows a vertically-oriented assembly, which would not be useful for preventing an errant vehicle’s movement on a roadway. The Casciola reference is not, however, limited to a vertically-arranged device. “While the device is illustrated in Fig. 7 as being arranged vertically so that it can absorb the force of a falling body such as an elevator which accidentally falls, for example, it is also possible to arrange the structure of Figure 7 horizontally.” (*Id.*, col. 5, ll. 59–65). The written description discloses that the invention may

be positioned either vertically (in the case of an elevator) or horizontally (in the case of a train or ship).

KEI also argues that in the Casciola ‘252 Patent, the terminal is not attached to the end of an elongated barrier anchored to a roadside. The ‘003 Patent requires a “terminal,” which this court construed as

a device attached to the end of an elongated barrier that is anchored to the roadside, or attached to the end of a fixed roadside hazard, *that prevents an errant vehicle’s movement perpendicular to the roadway* and, in cooperation with other components and the barrier or hazard, absorbs energy when a vehicle hits the terminal itself.

(Docket Entry No. 90, p. 56) (emphasis added). As Trinity points out, the embodiment described as useful for stopping a train “that does not stop within the required distance” could be attached to the end of a fixed roadside hazard; “any robust stationary support means” satisfies the “fixed” limitation. In this embodiment, however, the device would not prevent the errant vehicle’s movement perpendicular to the roadway, which is required for the “terminal” claimed in the ‘003 Patent. Instead, the device would prevent an errant vehicle’s movement parallel to the roadway. In the ‘003 Patent, the terminal slows the travel of an errant vehicle moving perpendicular to the roadway—that is, in a direction different from that intended. In the Casciola reference, the device that is attached to a fixed roadside hazard stops a vehicle traveling too far in the same direction as the road. The written description does not assign a specific function to the support means other than preventing a vehicle (a train) “that does not stop within the required *distance*.” (Docket Entry No. 164, Ex. 3, col. 5, ll. 64–65) (emphasis added). In the ‘003 Patent, the support structure prevents a vehicle

from traveling in the wrong “*direction*”—perpendicular to the roadway. Under this interpretation, the Casciola ‘252 Patent does not explicitly disclose a terminal attached to a structure that prevents an errant vehicle’s movement perpendicular to the roadway, which would preclude a finding that claim 6—or 8 and 12, which also require a “terminal”—is anticipated by the Casciola reference.

This interpretation is subject to the criticism that the words “prevents an errant vehicle’s movement perpendicular to the roadway” modify “elongated barrier” rather than “terminal.” That is, the elongated barrier is designed to prevent motion perpendicular to the roadway, but the terminal is designed to slow motion parallel to the roadway, as when there is a head-on collision with the end of the guardrail by a car driving on the shoulder of the road. But even with this criticism, the allegedly anticipating Casciola ‘252 Patent relies on a different mode of failure—deformation/compressive failure—rather than the cutting mode of failure in the in the ‘003 Patent. In addition, the anticipation argument suffers from a defect that was present with respect to the equivalence argument. In the ‘252 Patent, the compressive member is in line with the moving object that is being stopped. In the ‘003 Patent, the moving object is permitted to ride over the cut members, to avoid having the vehicle run into the remnants of the cut member. In other words, a feature that makes the accused device noninfringing under the doctrine of equivalents also contributes to a finding that the Casciola reference is nonanticipating.

C. The ‘820 Patent

Trinity argues that the asserted claims of the ‘820 Patent are anticipated by the Gertz

‘484 Patent. KEI responds that Trinity has failed to show by clear and convincing evidence that the Gertz ‘484 Patent teaches an “angled cutter” and points out that this reference was disclosed to the PTO during the prosecution of the ‘820 Patent.

The Gertz ‘484 Patent discloses an “energy absorbing apparatus []to dissipate the energy of a vehicle.” (Docket Entry No. 145, Ex. 10, Abstract). The Gertz reference teaches stacked grids of a lattice or honeycomb design. The spaces within the lattice or honeycomb are filled with a deformable material, such as hex foam. The grids may be made of “cardboard, plastic, plastic coated paper [], paper, glass fiber cloth, aluminum, or other metals or materials.” (Docket Entry No. 145, Ex. 5, Gertz ‘484 Patent, Col. 3, ll. 30–33). The stacked grids are placed in containers attached within the U-shaped section of a guardrail structure that has telescoping rails. As the guardrail telescopes in an impact, the containers are crushed and the grids are forced together. The cutting action occurs between a series of displaced or offset grids or lattices, which cut through the foam and eventually the other grid or lattice structure. Energy absorption is accomplished through the lateral compression of the foam surrounding the lattices and the shearing of the grids when the multiple edges of the lattice or honeycomb sheets cut into each other. The Gertz ‘484 Patent describes the operation of the grids, as follows:

In operation, an impact force, such as caused by an errant vehicle. . . is applied substantially normal to the face of the top sheet 1 so that the abutting edges of the walls of the sheets are forced to cut into or shear into one another and into the foam blocks. . . . The shearing action of the walls of the sheets provides a uniform resistance to the impact force and thereby dissipates or absorbs the energy of the force.

As the walls of the sheets shear into one another, the foam blocks 9 and 19 are compressed and thereby generate an additional resisting force that further dissipates the energy of the impact force. Thus the energy of the force is substantially reduced by cutting the foam and the sheets 1 and 11 and by compressing the foam. . . . [T]he shearing action of the improved structure is generally superior to the shearing action of an empty cell structure which has unsupported walls that may tend to crumple or buckle, rather than to shear.

(Docket Entry No. 162, Ex. 5, Gertz '484 Patent, col. 3 ll. 34–col. 4 ll. 6).

1. The Issue of the Angled Cutter

Trinity argues that the Gertz '484 Patent discloses the limitations of claims 3, 4, 11, and 14 of the '820 Patent. The primary dispute is whether the Gertz reference discloses an "angled cutter." This court construed "angled cutter" to mean:

An angled structure that cuts, in which "angled" means that at least one edge of the angled structure is oriented other than perpendicularly to the material to be cut.

(Docket Entry No. 90, p. 73).

Trinity argues that the "angled" limitation applies only to one edge of a structure that cuts; KEI argues that the limitation applies to the cutter itself. KEI argues that the "cutter" in the Gertz reference—the honeycomb structure—and the "cuttable member"—the foam—are oriented perpendicularly to one another. Trinity asserts that the "other than perpendicular" limitation is met because the cell walls that make up the grids themselves intersect at angles that are other than perpendicular. Trinity argues that the honeycomb sheets in Figures 4 and 5 show an angled cutter because the intersecting walls of the grids approach the foam at a zero degree angle, which is less than ninety degrees. Trinity's expert witness, Dr. Malcolm Ray,

states in his report that “[s]ince the edges of the cutting surface of the lattice wall are in the same plane of the surface of the foam they are oriented parallel to the material to be cut (i.e. the foam)” and the angle is zero. According to Trinity, KEI does not take into consideration that the “angled cutter” limitation of the ‘003 Patent requires only one edge of the angled structure to be other than perpendicular. *See In re Simpson*, No. 03-1530, 102 Fed. Appx. 675, 679 (Fed. Cir. 2004) (claims calling for cutting die with “at least one scrap cutting blade” precluded the patentee’s argument that the claims were not anticipated unless the prior art disclosed two blades).

KEI argues that Figure 4 shows that the honeycomb sheets are stacked vertically on top of each other, and that “[i]n operation, an impact force causes the upper honeycomb sheet and the lower honeycomb sheet to shear into one another.” (Docket Entry No. 162, Ex. 5, Gertz ‘484 Patent, col. 5, ll. 34–36). KEI points out that a cutting edge approaching a cuttable member at a zero degree angle would not reach the cuttable member. Instead, a cutter that approaches a cuttable member at a zero degree angle moves in a parallel plane with respect to the cuttable member.

Trinity argues that KEI impermissibly adds limitations to the claims of the ‘820 Patent with respect to the angle at which the cutter moves, to require the cutter itself to approach the cuttable member “along an acute vector.” *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 904–05 (Fed. Cir. 2004); *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (improper for patentee to import “extraneous” limitation to avoid anticipation apart from the meaning of particular words or phrases in the claim). In this case, KEI’s construction does

not impermissibly import “extraneous” limitations but reflects this court’s construction of the asserted claims of the ‘820 Patent. Trinity’s argument assumes that if any part of a structure that contains a cutter is oriented “other than perpendicular to the material to be cut,” the “angled cutter” limitation is met. This argument, however, means that a structure with many edges that do not cut but are oriented other than perpendicularly to the material to be cut would meet the limitations of an “angled cutter.” This argument proves too much; under this interpretation, virtually any structure that has a cutting edge would meet the limitations of the ‘820 Patent.

The ‘820 Patent discloses two embodiments of the angled cutter, the dual plate cutter in Figure 7 and the wedge-shaped cutters of Figures 9 and 15. The dual-plate cutter consists of two metal plates positioned in parallel planes and welded together. “The first and second steel sections 70 and 72 are each abrasion resistant steel plates dimensioned to be stronger than the W-beam so as to be able to sever it.” (Docket Entry No. 65, Ex. 5, ‘820 Patent, col. 6, ll. 32–34). Where the two plates meet “at a point . . . an acute angle is formed” and the “location of the point . . . is positioned to engage” the cuttable member. At the point, “the force of the impact of the vehicle causes cutting.” (*Id.*, col. 6, ll. 53–57, ll. 65–66). The wedge-shaped cutter consists of two joining faces that form a “forward pointed edge.” (*Id.*, col. 7, ll. 24–25). In both embodiments, the two parts meet at a point and both parts approach the material to be cut at an angle other than perpendicular. It is the intersection of the two cutting edges that contacts the material to be cut.

“[T]he dispositive question regarding anticipation is whether one skilled in the art would reasonably understand or infer from the prior art reference’s teaching that every claim [limitation] was disclosed in that single reference.” *Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003) (internal quotation marks and alterations omitted). The Gertz ‘484 Patent does not claim an angled cutter that meets all the limitations of the ‘820 Patent claims.

The motion for summary judgment on anticipation is denied.

VI. Conclusion

KEI’s motion for summary judgment as to its ownership of the ‘003 Patent is granted. Trinity’s motion for summary judgment that the MPS-350 and TRACC do not infringe the ‘003 Patent and the ‘820 Patent is granted. Trinity’s motion for summary judgment that the ‘003 and ‘820 Patents are invalid for failure to comply with the written description

requirement and as anticipated by prior art is denied. The issues of inequitable conduct will be separately addressed.

SIGNED on September 30, 2005, at Houston, Texas.



Lee H. Rosenthal
United States District Judge